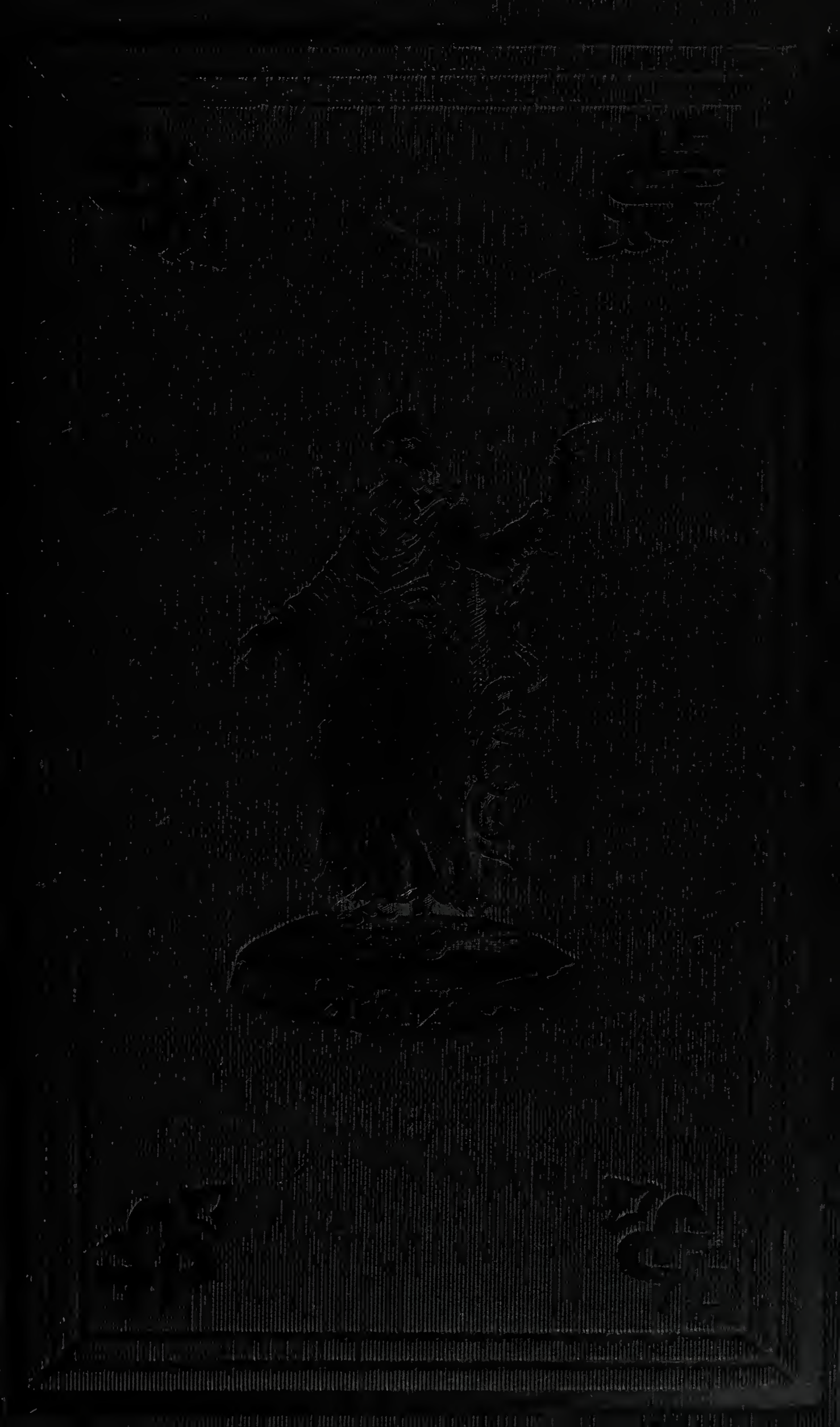

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HALF-YEARLY ABSTRACT

OF THE

MEDICAL SCIENCES.

JANUARY—JUNE

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THE

HALF-YEARLY ABSTRACT

OF THE

MEDICAL SCIENCES:

BEING

A PRACTICAL AND ANALYTICAL DIGEST OF THE CONTENTS OF THE PRINCIPAL BRITISH AND CONTINENTAL MEDICAL WORKS PUBLISHED IN THE PRECEDING SIX MONTHS.

TOGETHER WITH

A SERIES OF CRITICAL REPORTS ON THE PROGRESS OF MEDICINE AND THE COLLATERAL SCIENCES DURING THE SAME PERIOD.

EDITED BY

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PHYSICIAN TO THE SUFFOLK GENERAL HOSPITAL.

Apparatu nobis opus est, et rebus exquisitis undique et collectis, arcessitis, comportatis.
Cicero.

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PREFACE.

Apparatu nobis opus est, et rebus exquisitis undique et collectis, arcessitis, comportatis. CICERO.

To keep pace with the advance of medical science, by the perusal of the numerous works which are continually proceeding from the press, is a matter of difficulty even for the man of leisure; for the busy practitioner to do so is next to an impossibility. The latter individual, however, is precisely the one to whom a steady and progressive acquaintance with the practical improvements and discoveries of the day is most necessary, as it is he who is the most frequently placed under circumstances requiring a ready fund of therapeutical resources. To render this, under ordinary circumstances, impossibility, a matter of comparative facility, is the object of the present publication. It is intended therein to place before the profession the practically valuable information gathered from the records of all countries, in a form so condensed and tangible, that the man in active practice, to whom economy of time is of the utmost consequence, shall be able at a glance to make himself familiar with the discoveries, new doctrines, and improvements in each department of medical science, the seeking of which in their original sources would have involved such a sacrifice both of time and money as few would think themselves justified in encountering.

The value of similar undertakings to the present has long been recognized on the Continent, as is evidenced by the extended reputation of the Jahrbücher of Germany, and the

Encyclographies of France and Belgium. It is the Editor's ambition that he may produce a work which shall occupy, in the estimation of the British practitioner, the same honorable position. In order that he may deserve the accomplishment of this his anxious wish, no amount of toil or expense has been spared by him. Not only is every periodical work of note published in Great Britain, America, France, and Germany, subscribed for and personally consulted, but every standard publication and monograph which can be obtained is analysed as it may come to hand. The Editor flatters himself that by this extensive labour he is able to offer to the profession an analysis of the real progress of the medical science more complete than has to his knowledge ever been attempted, as each volume of the "Half-yearly Abstract" will embrace every department of that science.

It is with peculiar satisfaction that the Editor is able to state, as a guarantee for the correctness of the work, that he has secured the assistance of men respectively eminent in the departments which have been intrusted to them; and whatever may be the opinion of the portion of the work which has fallen to his own immediate share, he feels convinced that the labours of his coadjutors will meet with a favorable reception.

The Editor scarcely deems it necessary to dilate upon the abstract necessity of being acquainted with the progressive medical literature of the day. The mere practical man, as he delighted to call himself,—in other words, the man who knows and wishes to know nothing more than falls under his own narrow sphere of observation,—is, fortunately for science as much as for the public, nearly obsolete. Both the public at large and the profession itself have long discerned, that for one man who by his own unaided experience arrives at anything like eminence, a hundred remain for ever in an inglorious mediocrity, and both recognize the fact, that for a man to be a safe and a conscientious practitioner, he must be a constant and an indefatigable student. It is then in the humble hope of being able to offer increased facilities towards this necessary acquaintance with the results of the experience of others, that the Editor offers the present publication to the patronage of the profession; and he looks with

confidence to the love of science which is the characteristic of the medical practitioner of the present day, for that support which his extensive engagements requires.

A few words as to the plan which has been adopted may not be out of place. The usual productions of the medical press are of two kinds; the one, simply practical, the other, though not in so direct a manner applicable to practice, such as is nevertheless necessary for the formation of those *principles* of treatment, without which, the hand that exhibits a medicine or wields an instrument, is as guilty of gambling as if it held a dice-box. It has been the Editor's endeavour, while he includes both species of information, to give a prominent place to that which is directly available at the bedside; for which reason, he has devoted to it a large portion of the work. The 'Reports,' which form the concluding part of each volume, are intended to comprise a survey of communications and works of the second kind, and at the same time to point out the practical bearing of each.

It will be observed, that in certain departments of the Medical Sciences, as Anatomy and Physiology, Chemistry, Forensic Medicine, and Materia Medica, no separate abstracts have been made. This has been determined upon after careful reflection, as it was thought that the subjects contained in those departments might with greater effect be embodied in the 'Reports.'

In now committing the result of much labour, expense, and anxiety, to the ordeal of public opinion, the Editor is willing to confide solely in its real merits for the success which he is anxious to obtain; but he at the same time requests his readers to make some allowance in this, the first volume, for the difficulties and drawbacks of which no one who has not attempted a similar undertaking can form an adequate idea.

Bury St. Edmunds, *June* 1845.

LIST OF BRITISH AND FOREIGN PERIODICALS REFERRED TO IN THE "HALF-YEARLY ABSTRACT."

BRITISH.

British and Foreign Medical Review.
Medico-Chirurgical Review.
" *Transactions.*
Transactions of the Provincial Medical Association.
Edinburgh Medical and Surgical Journal.
London and Edinburgh Monthly Journal.
Dublin Journal of the Medical Sciences.
Lancet.
Medical Gazette.
Provincial Medical Journal.
Medical Times.
Dublin Medical Press.
Bell's Pharmaceutical Journal.
Guy's Hospital Reports.

AMERICAN.

American Journal of the Medical Sciences.
" *of Science and Art.*
Philadelphia Medical Examiner.
New York Journal of Medicine.

FRENCH.

Annalse de Chirurgie,
" *d'Hygiène.*
" *de Chimie et de Pharmacie.*
" *des Maladies de la Peau.*
Archives Générales de Médecine.
Bulletin des Académies.
Encyclographie Médicale.
" *des Sciences Médicales.*
Journal des Connaissances Médico-Chirurgicales.
Gazette des Hôpitaux.
" *Médicale.*
Journal de Chirurgie de M. Malgaigne.
Revue Médicale.

GERMAN.

Schmidt's Jahrbucher.
Zeitschrift für de Gesammte Medicin.
Müller's Archiv für Anatomie, &c.
Liebig's Annalen der Chemie und Pharmacie.

N.B. Every periodical here specified is consulted *directly* by the Editor and his coadjutors.

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ABSTRACT OF THE MEDICAL SCIENCES,

&c. &c.

PART I.

PRACTICAL MEDICINE, PATHOLOGY, & THERAPEUTICS.

SECTION I. ZYMOTIC DISEASES.*

Art. 1.—*On Prognosis in Typhoid Fever.* By M. Rostan.

(*Gazette des Hôpitaux*, Jan. 1845.)

[The typhoid fever of the French and the typhus of this country, if not essentially distinct diseases, are at the least, there is reason to believe, distinct varieties of the same species. Certain it is that we shall look in vain in the continued fevers of Great Britain for that peculiar affection of the intestinal glands which forms so prominent a feature in the continental disease, and the constancy of which may well excuse the opinion held by many French pathologists, that typhoid fever is essentially a gastro-enteritis. It is no part, however, of this portion of the present work to enter into those controversial discussions, of which the subject of fever has at all times been so fertile a source; we merely allude to a point which necessarily involves a difference of opinion, in order to remind our readers that in the following observations the author refers to that form of the disease in which the abdominal complication plays an important part]:—

The prognosis in typhoid fever is always discouraging, even in the mildest forms of the complaint. The danger is in all cases proportionate to the age of the subject, being *cæteris paribus* greater in the old than in the young. Sex appears to exercise but little influence over the mortality of the malady; neither does climate produce any marked modification in the severity of its symptoms. It is always necessary in forming our prognosis to take the constitutional power of the patient into the account. A feeble constitution is always unfavorable; but it must be allowed, nevertheless,

* The term Zymotic (ζυμόω, to ferment,) is applied to that class of diseases, including those of epidemic, endemic, and contagious character, which arise in consequence of the introduction into the system of an animal or vegetable poison.

that we have frequently seen the robust more rapidly cut off by the fever than the weakly.

Mental distress and grief are among the most injurious circumstances to which a fever patient can be exposed. This was distinctly seen during the years 1814 and 1816, when the hospitals were crowded by sick soldiers who were rapidly destroyed under the depression consequent upon defeat. We have continually seen those patients sink who were harassed by the fear of death, while others less timid as constantly recovered. Excesses of all kinds are likewise unfavorable to the patient.

As regards the progress of the disease;—we have noticed that when typhoid fever passes rapidly through its different stages or periods, it is in the majority of cases apt to be fatal. Notwithstanding, a fever which at the onset is marked by alarming symptoms, may occasionally become sensibly ameliorated in the respect of danger.

The character of the local symptoms affords a most useful means of arriving at a correct prognosis;—for instance, the predominance of cerebral symptoms declares the existence of a dangerous form of the disease; experience having shown that cerebral symptoms are present in a large proportion of fatal cases. The asthenic form of fever has also very commonly an unfavorable termination.

Delirium occurring early in this disease is more dangerous than when it happens later; it is also to be feared in proportion to its violence and duration. A certain value is justly attached also to the state of the tongue—for this organ to be dry and furred is a bad omen, but when in addition to this it becomes brown or black, the disease in the majority of instances proves fatal. When, on the contrary, the tongue is but little altered, or remains moist; or if, having become dry, it again becomes moist,—it is either a sign of amendment, or indicates a mild form of fever. It is necessary in estimating the state of the tongue to notice whether or not the patient sleeps with the mouth open.

Vomiting is an unpleasant symptom, especially in the latter stages of the fever; it is of less consequence in the commencement. As regards the state of the bowels, some physicians look upon constipation with more alarm than diarrhœa. We are not of this opinion, but, on the contrary, regard an obstinate and continual purging as one of the worst symptoms which can arise.

Retention and dribbling of the urine during the course of typhus fever are bad signs, as these symptoms indicate extreme debility: so likewise are starting of the tendons and coma, for it is seldom that a patient recovers after their appearance. Among the most fatal signs we would also enumerate deafness, rapid emaciation, and the facies hippocratica.

A pulse of 120 is a symptom which ought not to be lightly regarded, especially in the latter stages of the complaint. It is rare that a patient recovers when the pulse has reached 140.

There are other circumstances which are to be considered as complications of this fever, and which must materially influence the nature of our prognosis;—for instance, the occurrence of pneumonic or gangrenous sloughs on the sacrum, must render our opinion unfavorable. There is one symptom which, although it is considered to be critical by some, we consider to be almost inevitably of fatal augury; we allude to inflammation and swelling of the parotid glands. Our prognosis should also be cautious when one or more abscesses occur in the cellular tissue of the limbs, or other parts of the body.

Art. 2.—*Memoranda in the Treatment of Typhus Fever.*

By Dr. Davidson.

(*Edin. Monthly Journal,* and *Lancet,* 1844, p. 406.)

[The following extracts are a recapitulation of the principal points contained in a paper of considerable length upon the subject of fever and its complications.]

1. Typhus fever cannot be checked *in limine;* it is often tedious in its progress, causing great emaciation and exhaustion; we ought not therefore, without special reasons, to employ any measures calculated to lessen the powers of life; such as nauseants, bleeding, and excessive sweating.

2. The ordinary treatment may be as follows:—Place the patient in a large well-ventilated apartment, on a mattress with few bed-clothes; let the head be shaven and kept cool with an evaporating lotion; give a gentle purgative every second or third day; let the skin be bathed once or twice a-day with tepid water; and this may be accompanied with small doses of antimony or ipecacuanha. The drink should be light, cool, and slightly diuretic; the food nutritive but light. When there is a tendency to local congestion, a little calomel or hydrargyrum c. creta may be combined with the purgative; or calomel and opium may be given every six or eight hours. The application of two or three leeches to the temples or nostrils is often useful in cerebral congestion, and when there is intense headache, the forerunner of delirium. Blisters are likewise advantageous in such cases.

3. Mercury in small doses is useful in promoting the secretions, and in relieving internal congestion.

4. Opium is injurious in a large proportion of cases, from its tendency to induce congestion of the cerebral vessels; but when diarrhœa is present, it ought to be given with a view to check the exhausting discharges.

5. Wines, &c., as they contain both stimulant and nutritive elements, are most to be relied upon for supporting the strength. The pulse taken with the general symptoms of exhaustion, ought to be the guide for their exhibition.

6. Ammonia, camphor, and quinine, are not to be depended upon in bad cases.

7. When the disease is complicated with local affections in the head, chest, or abdomen, these must be treated on the same principles as the idiopathic disease, with this important modification, that evacuatives of all kinds must be used more sparingly, and that even in these cases, if there be much prostration of strength, wine must be exhibited, though more moderately than in the simple disease.

Art. 3.—*On Pericarditis; a complication of Scarlatina.*

By S. Alison, M.D., Physician to the Northern Dispensary, &c.

(*Medical Gazette,* Feb. 1845, p. 664.)

[There is no fact which should be more constantly present to the mind of the practical physician than the proneness of vital organs to assume a morbid action during the course of certain affections to which they have no necessary pathological relation. That pericardial disease forms a serious complication in rheumatism has long been familiar to the profession; it would seem, from the following interesting article, that it is not uncommonly also a source of fatal mischief during the progress of scarlet fever]:—

The most cursory glance at the abstracts of the causes of death in this country prepared by the Registrar-general, suffices to indicate the great importance of scarlatina as a cause of mortality. The abatement of this mortality is well deserving of the best endeavours of the physician. Notwithstanding that the history of scarlatina has of late years been made more accurate and satisfactory under the able hands of Tweedie, Burrows, Wood, Willis, &c., much is still wanting to complete the portrait. The condition of certain organs during the course of the disease, and the complications which are wont to arise are not as yet fully made out.

A more extended knowledge of these complications will prove highly salutary, both by leading to increased precaution with a view to their prevention, and to an improvement in their treatment. It is with this impression that we have ventured to request the attention of the profession to a few facts connected with the disease, which have lately fallen under our notice. It has long been known that scarlatina is liable to be complicated with inflammation of the brain, but it does not appear that the possibility of the supervention of *pericarditis* is so generally recognized. The occurrence of three cases of this complication in our practice within the last few months has convinced us that the occurrence is more common than may be suspected, and has induced us to refer to various esteemed writers on scarlatina for the purpose of discovering what notice this complication has received.

The writers who have alluded to pericarditis during scarlatina are Dr. G. Burrows (Art. *Scarlatina*, in the *Library of Medicine*,) and Dr. Robert Willis, who, in an able article, (No. 10 of the *London and Edinburgh Journal of Medical Science*,) remarks that in examining bodies of those who had died of scarlet fever, he has sometimes found inflammation of the pericardium. Dr. Joy also observes, that pericarditis frequently makes its appearance in the course of eruptive fevers, and more especially of scarlatina. Dr. Copland, Rilliet and Barthez, and Puchelt, appear likewise to have been aware of the complication.

On the other hand, the list of those writers on scarlatina who make no allusion whatever to the intercurrence of pericarditis is very numerous. Burserius, in his Institutes of Medicine, is silent on the subject, so likewise are Dr. Wells and Dr. Wood, who published a carefully-compiled report of the scarlatinous epidemic of 1835-6. Dr. George Hamilton, who has written on scarlatina in the 47th vol. of the Edinburgh Medical and Surgical Journal, does not once allude to the subject; neither does Dr. Hope in his work on Diseases of the Heart. Dr. Tweedie also, in his valuable paper on Scarlatina in the Cyclopædia of Practical Medicine, is silent on the subject. Dr. Watson, in his most practical Lectures on the Practice of Physic, does not place pericarditis among the complications of scarlatina, but, on the contrary, mentions that the affections of the joints simulative of rheumatism, occurring in course of scarlatina may be distinguished from true rheumatism by the absence of cardiac implication. [The author illustrates his position by the mention of the following cases :]

Case I.—J. S., æt. 4, a fine healthy boy, became the subject of scarlatina last June. Eruption full, attended with considerable pyrexia; the throat much inflamed and swollen. The child had become apparently convalescent, when about three weeks from the accession of the eruption the scrotum was observed to be œdematous. The swelling extending over the surface of the body, he became an out-patient to one of the hospitals: under the treatment there pursued, the anasarca greatly diminished, notwithstanding which the general health became much deteriorated.

On 27th of August the anasarca was slight, but effusion into the right pleura was indicated by dulness on percussion, obscure respiration, and expansion of the side. The heart's action was rapid, violent, and tumultuous. There was also orthopnœa and great restlessness. Pulse 140, respiration 60 per minute. The urine was not albuminous. The patient rapidly became worse, and died, after suddenly calling out in an urgent manner and attempting to vomit.

Autopsy thirteen hours after death. The pericardium was intimately attached to the pleura costalis, and contained six ounces of sero-purulent fluid. The serous membrane was thickened both where it lined the pericardial sac and where it covered the heart, and was invested with a thick plastic lymph.

Case II.—Fred. Cook, æt. 6, well grown, was in perfect health until seven days since, when he was attacked by scarlet fever. The eruption appeared on the second day and disappeared on the fifth. During the night of the sixth day he was suddenly seized with violent pains in the precordia, and became restless and agitated; the mother remarked violent palpitations of the heart. When seen within twelve hours of this seizure he complained of severe pain in the region of the heart increased by pressure in the epigastric region. The impulse of the heart was stronger than natural, and was felt over the whole anterior part of the left chest,—the most cautious examination discovered neither bellows' nor rubbing sound. The pulse was 120, regular and full; features expressive of anxiety; urine scanty, and deposits the lithates.

V. S. ad ℥ij. Mist. vini ant., Potass. tart. et nitrat. potassæ. Sæpe sumenda.—Hyd. chlorid. grs. ij, tertiis horis. Hirud. iij præcordiis.

The next day, Nov. 17th, the patient felt relieved, the precordial pains being much abated. The blood was slightly buffed, serum straw-coloured, sp. gr. 1025. The cough is less frequent and face less anxious.

Repetentur Hirud. tres præcordiis et continuentur medicamenta.

18th. Patient is much easier. 19th. No pain in the region of the heart; pulse 100. 22d. Sits up in bed.

After the lapse of ten days, the patient became the subject of anasarca with albuminuria, which was removed under the exhibition of Infus. gent. and Spt. æth. nitrici. At the present time (Dec. 18th) he is strong, runs about the house, and is rapidly regaining his florid colour. The heart's action, however, is still increased to a slight extent.

Case III.—27th Dec. 1844. John Jones, æt. 9, seized with scarlatina nine weeks ago. The eruption was general, and remained out two or three days. The patient complained of pain in the chest, with "thumping and knocking" of the heart during the period of the eruption. At the same time he suffered pains all over the body, but particularly in the ankles. The patient was treated for pleurisy, and recovered to a certain degree, but the precordial "thumping" still continued.

Period of Accession of Pericarditis. It is impossible to say positively at what period of the exanthem the affection of the heart supervened in the first case, for its presence was not suspected until the child was dying; but it is probable from the post-mortem appearance that the disease had existed from an early period. In the second case, the symptoms of pericarditis were strongly manifested on the seventh day of the exanthem. In the third case the excitement of the heart's action with the pain took place during the period of the eruption.

Character of the Fever. In all the three cases there was considerable

inflammatory fever, the eruption was vivid, and persisted the usual time. The fauces in all the cases were more or less inflamed and swollen. The mucous membranes were reported to have been unusually red in the case which terminated fatally; in the case of Cook the tongue was red with elevated papillæ. Anasarca of a decided character showed itself in the first and second cases, but was not general in the third.

Causes of the Pericarditis. From a careful consideration of the cases above related, it appears probable that pericarditis, when it occurs as a complication of scarlet fever, may owe its origin to two different sources; viz. the presence of the specific poison in the blood, acting as a local irritant, and the presence of crystallizable compounds in the circulation, which should have been eliminated from the system by the kidneys.

That pericarditis should occur in the course of, or subsequent to, scarlatina, is not surprising. It is well ascertained that pericarditis is liable to follow obstructive disease of the kidneys, and it is further more familiar to all, that obstructive disease of the kidney is not uncommon during the convalescent period of scarlet fever. It would perhaps be difficult to explain the circumstance, did pericarditis not occur under circumstances known to be productive of inflammation of other serous membranes.

Treatment. This may be resolved into preventive and curative. The former must comprise means which will moderate the violence of the exanthem without unduly depressing the powers of the system. The curative treatment must be conducted upon those principles which regulate the management of inflammation of other serous membranes. General bleeding must be moderate, and employed only when the patient is still possessed of considerable strength. Leeches, mercury, and counter-irritation will be necessary. As a general rule it will be prudent to avoid blisters and oil of turpentine, on account of their special action upon the kidneys.

Art. 4.—*On Dropsy after Scarlet Fever:*—An interesting discussion on this subject took place at the Medical Society of London, at the meeting, of Nov. 19, 1844, in the course of which many very practical remarks were elicited. The paper was read by Dr. Wilshire, who opposed the opinion too generally held, that the affection is in all cases inflammatory, and requires antiphlogistic treatment. He believed, on the contrary, that the disease is one of an asthenic character, especially in the children of the lower classes. He had found that in the greater number of cases the iodide of potassium given in a bitter infusion was of great utility, but he considered that quinine was frequently necessary in the later periods of the disease, and in those cases characterized by *anæmic* urine. The author agrees with M. Piorry that let the origin of the albuminous urine be what it may, the blood is altered in its constitution; and asks the question, whether albuminuria, as consecutive to scarlet fever, does not *precede* the lesion of the kidney. Dr. Golding Bird, who took part in the discussion, recognizes two varieties or classes of cases of scarlatinal dropsy: the one arising from simple debility, which is usually speedily removed; the other caused by the fever, and which is highly dangerous, inasmuch as the blood is poisoned by containing the uneliminated elements of the urine. This latter class of cases, according to Dr. Bird, occurs in practice under three forms. In one the disease is very acute, and if seen early the urine is not only albuminous but contains the colouring matter of the blood also. In the second class, the urine is always albuminous but contains no blood. In

these two cases Dr. B. orders a hot mustard poultice to the loins, and antimony in diaphoretic doses, maintaining at the same time an even temperature in the room. When the albumen has disappeared from the urine iron and quinine are required. In the third class of cases, which are chronic, support and tonic medicines are necessary from the first. Dr. B. remarks that he had never known dropsy follow in those cases of scarlatina in which *warm baths had been employed as soon as desquamation commenced.*

(*Reported in the Lancet*, Nov. 30, 1843, p. 298.)

Art. 5.—*Case of Acute Glanders.* By M. Pavard.

(*Journal de Méd. et de Chirur. pratiques.*)

[Although within the last few years several cases of glanders have been placed on record, it appears to us that the following instance is worthy of further publicity. At the bedside, practitioners are not sufficiently alive to the possible occurrence of this disease, and the diagnosis consequently becomes a matter of doubt and uncertainty. That the following is a genuine case of glanders we fully believe, as it tallies in the most minute particulars with a case which we happened to witness some years since in the hospital of La Charité, under M. Andral]:—

"M. De Bavent, æt. 43, was the owner of several horses which became glandered; not believing in the contagious nature of the disease, he attended to them himself, frequently cleansing the nostrils with his pocket-handkerchief. Some time after he became the subject of indurated axillary glands, with a pustular eruption on the hands. This subsided, but he still remained out of health, when he happened to wound his finger with the sharp part of a harness buckle. The hand had become much swollen, when M. P. was summoned, and recommended cataplasms and a free division of the wound: this was on the 24th of October. On the 27th, the patient was in much the same condition, the finger being more painful. On the 26th, nausea and vomiting supervened, and erysipelas showed itself on the dorsum of the hand. The wounded finger exhibited a large bulla filled with sanguineous fluid. Nov. 2d. The knees became red and tumefied, and pustules arose on the cheeks, the rupture of which gave issue to a yellowish sanies. There was considerable fever with thirst and delirium; the root of the nose now began to swell, and the face was puffy and of a dull red colour. The nostrils discharged a reddish fluid which quickly concreted upon the upper lip, and at the same time the forehead became covered with bullæ of the size of a pea which contained a yellow fluid. On the 5th, the local symptoms about the face had increased in intensity, and in addition, livid patches appeared on the extremities, resembling the ecchymosis from contusion. In the progress of the case fresh phlyctenæ arose in different parts of the body, and he died on the evening of the 6th completely exhausted."—[The treatment adopted in this instance was of the most inert kind; bleeding was proposed, but fortunately for the patient not acceded to; the remainder of the treatment consisted in the exhibition of small doses of acetate of ammonia. The case which we have alluded to as having fallen under our own observation, was also fatal, although a more rational treatment, consisting in the employment of stimulants with sedatives, was adopted from the commencement.]

Art. 6.—*On the Treatment of Hydrophobia by the Euphorbia Villosa and Palustris.* By Dr. Krebel.

(*Gazette des Hôpitaux*, Fevr. 13th, 1845.)

[The utter hopelessness of the attempts which have hitherto been made for the cure of this fearful malady render any suggestions, even though they be *prima facie* improbable, worthy of some consideration. It may be observed that the *E. villosa* is the *pilosa* of Linnæus; the *E. palustris* is not indigenous to this country.]

In the month of May, 1843, six men and two bullocks were bitten by a rabid wolf. The men came shortly after to the hospital for assistance, each exhibiting wounds of considerable severity. The surgeon in attendance after cleansing the parts, and touching them with concentrated muriatic acid, ordered them to be bathed in a decoction of the euphorbia. At the same time he caused the patients to take fasting a small wineglassful of a decoction of the roots of the plant, of the strength of 30 grammes to 500 grammes of water. This was continued three or four days, till the medicine ceased to produce either vomiting or purging.

At the end of three weeks from the accident, the bullocks all died with symptoms of rabies, but with the exception of one individual none of the men were attacked, although they all complained of pain in the cicatrix of the wounds.

Four peasants and an infant were bitten by a rabid cat. The child died soon after with all the symptoms of hydrophobia. One of the peasants was likewise attacked, but was saved, as were the other three, by taking a decoction of the roots of the euphorbia palustris upon the recommendation of their parish priest. M. Krebel likewise relates the following case: He was summoned to a woman said to be dying, and whom he found in the last stage of hydrophobia. He made her drink 450 grammes of the tisane of euphorbia at one draught; the patient then fell asleep, and after having been severely purged completely recovered.

SECT. II. DISEASES OF THE NERVOUS SYSTEM.

Art. 7.—*On the Causes and Prevention of Apoplexy and Paralysis.* By Marshall Hall, M.D. F.R.S.*

There is no more delicate or more momentous question in the practice of medicine than that of the prevention of the attacks of apoplexy, hemiplegia, or other paralytic affections. These arise from such different and even opposite causes, that the very course of medicine and regimen which is most conducive to safety in one case, has the opposite tendency in another; wherefore the diagnosis on which our treatment depends requires the utmost care and attention.

There is sometimes a state of plethora, sometimes of anæmia, and in other cases there is neither the one nor the other, but that morbid condition of the system called cachexia, often denoted by boils, carbuncles, &c., with deranged secretions—as the predisposing cause of attacks of paralysis.

Allied to this last condition, is that which obtains in dyspepsia and gout.

* Practical Observations and Suggestions in Medicine. 8vo. London, 1845.

The imperfect performance of the function of the liver, and especially of the kidneys, is in another class of cases, the cause of these formidable diseases. In other cases there is disease of the heart, or of the minute arteries and veins, or of the capillary vessels of the brain and its membranes.

The attention of physicians has until recently been too much directed to fulness as the general cause of the apoplectic or paralytic attack; and as to the public, they have to this moment only one idea—that a fit denotes fulness; and the practitioner who, on being summoned to such a case, shall brave this opinion, and, depending on his professional knowledge, discard that invariable refuge of the timid and ignorant, the lancet, will make himself responsible for the issue.

[The author after stating that the real principle upon which an apoplectic seizure is to be prevented, is to induce a state of equilibrium in regard to plethora or inanition, and of health in regard to the general tone, habit, and secretions, proceeds to remark upon each of the conditions to which he before adverted; and first, of]:—

1. *Plethora.* When plethora is the cause of the threatening of apoplexy, the remedy and safety of the patient consists in depletion. How are we to be certain of the fact (of plethora)? There may be the appearance of the sanguineous temperament, an athletic form, &c.; and with all this, there may be headache, vertigo, and other symptoms of head affection. But is it certain that the symptoms in such a case depend upon fulness? If there be, in addition to the symptoms enumerated, a disposition to *doze*, it is nearly so. But in the absence of such symptom, and even with such symptom, may not the real case be indigestion? Certainly; then what is to be done?

There is a [diagnostic] symptom of great value, when it can be clearly ascertained to exist. It is the occurrence of vertigo, first, in the act of stooping, and secondly, in an unusually erect posture, especially when suddenly assumed. But if this be absent, what is then to be done?

There is a resource in such a case, which, in spite of the criticism of a respectable author, I will again venture to assert is of immense value. There is no case in which a patient, if bled from a good orifice, in the erect posture, bears to lose so much blood before syncope takes place, as in that of real congestion of the cerebral vessels; there is no case in which full abstraction of blood is so necessary. On the other hand, in the case of vertigo, and other cerebral symptoms arising from dyspepsia, the patient neither bears the loss of much blood, nor requires it.

In a doubtful case, I propose to adopt this mode of bloodletting, first, as a guard against the undue loss of blood, and secondly, as a means of *diagnosis*, and a prompter of ulterior proceedings. I have adopted this measure so often, and with such satisfactory results, that I cannot recommend it too strongly to my medical brethren. In cases, on the other hand, in which it has not been adopted, I have seen one class of patients become a prey to apoplectic or paralytic seizures, for want of bloodletting, and another affected with headache and vertigo, drained of blood (uselessly) by repeated cupping and leeches.

2. *Anæmia.* I now come to speak of cases in which anæmia has already been induced. This is not a state of immunity even against an attack of paralysis or apoplexy. I constantly see patients who are in jeopardy, not from fulness, but from inanition, and who have been kept in a state of anæmia by bloodletting, general or local, when an opposite treatment is required to restore the equilibrium of the system.

A state of pallor; a disposition to vertigo, faintishness, palpitation; a state of nervous timidity; the recurrence of the symptoms when the stomach is empty, when the bowels are freely moved, or upon looking upwards, or resuming the upright position after stooping or rising from the bed,—such are the diagnostic signs of a state of inanition from that of plethora.

The history of the case is in every respect a great aid in the diagnosis. If depletion has been used, it has been attended with this result—temporary alleviation, with subsequent aggravation of all the symptoms; an opposite mode of treatment, very cautiously adopted, and prudently pursued, involving quinine and iron, confers a more permanent, but less immediate benefit.

The state of anæmia itself is not without danger even of apoplexy or paralysis; the actual effusion of blood having occurred in some instances. Such a case is related by Denman; it occurred in the midst of exhaustion from hemorrhage from uterine polypus. We might, therefore, incautiously bleed our patient into hemiplegia.

3. *Dyspepsia, Cachexia.* I have so often observed symptoms threatening apoplexy in conjunction with symptoms of dyspepsia and cachexia, that I have no doubt of the importance of a strict attention to the subject. One form is the following: vertigo occurs with faintishness, nausea, and cold clammy perspiration; sometimes there is actual sickness and much flatus. In these cases the liver is torpid, and the urine is apt to deposit lithic acid salts. In no case is the loss of blood repaired with such difficulty. The application of a few leeches sometimes leaves a state of debility and pallor for weeks. The treatment consists in the correction of the secretions, and in giving tone to the system. The compound decoction of aloes, infusion of rhubarb, of gentian, and sarsaparilla, vinum ferri, and the bicarbonate of potash, are the principal remedies; but with these, a mild nutritious diet, a system of gentle exercises, early hours, and a strict attention to the condition of the feet and general surface, should be conjoined.

4. *Gout.* There is frequently a connexion to be traced between gout and its frequent attendant the lithic acid diathesis, and the apoplectic and hemiplegic seizure. The steady perseverance in such remedies as the Decoct. aloës compos., Bicarbonate of potass, &c., have in many cases averted the evil. The Vinum colchici should also be given, in very minute doses, as five drops three times a day, to overcome the specific gouty diathesis.

The lithic acid diathesis is not the only urinary disorder which leads to apoplexy and hemiplegia; the attack, as it is well known, occurs in diabetes, and in the case of albuminous urine.

Such are the predisposing causes of apoplexy and paralysis; the prevention must consist in removing them; and, according to circumstances, depletion, iron, sarsaparilla, colchicum, &c. must be prescribed, and steadily persevered in. (pp. 77-86.)

Art. 8.—*On Softening of the Brain.* By M. Rochoux.

(*Archives Générales de Médecine*, Nov. 1844.)

[M. Rochoux was one of the first pathologists who drew the attention of the profession to the consideration of cerebral softenings. This he did as long as thirty years ago. The present memoir embodies the results of his subsequent experience. After remarking upon the uncertainty with which the term "ramollissement" is employed, and inculcating the neces-

sity of restricting its application to true pathological changes, he proceeds to the immediate object of his communication, which is to discuss the curability of the lesion. He reduces the cerebral affections which are connected with softening to three classes: the hæmorrhagiparous softening, sanguineous infiltration, and inflammatory softening.]

1. *Hæmorrhagiparous softening.* In this form the texture of the cerebral mass undergoes a gradual molecular alteration, losing its consistence and force of cohesion, until a moment arrives in which its fibres are ruptured by the simple force of the circulating fluid. This, according to M. Rochoux, is the order of events in nineteen out of twenty cases of apoplexy.

To this theory, as the author observes, the objection has been made, that if the effusion of blood were in reality preceded in all cases by this textural change in the brain, this change, being strictly pathological, would be manifested by certain symptoms. To this, he replies, that a molecular change may go on in any organ of the body, and yet not be declared but by its results. He disposes of another objection to his theory, viz., that apoplectic clots are continually found surrounded by perfectly sound brain, by the statement that, if it be allowed that healthy brain is subject to rupture by the force alone of the circulation, that life would always be liable to extinction from that cause. He believes that the opinion is based upon erroneous observations; and affirms, that if the dissection had been carefully conducted, the truth of his remarks would always be made manifest.

The author next proceeds to describe the process of cure of cerebral softening. In the case of simple erosion, the affected surface cicatrizes gradually in proportion as the effused blood becomes absorbed, and its situation is eventually betrayed by only a slight depression. The obliteration of an apoplectic cyst in the centre of the cerebral mass, is obtained by the gradual approach of its parietes, and an interlacement of cellular and vascular bands from side to side, forming meshes, which contain a red or yellowish gelatiniform serum. The walls of the cavity do not progress beyond this point, and never come into perfect apposition, as stated by Beclard. The opinion of M. Durand Fardel, that this latter appearance is not indicative of the previous existence of a clot, but is the remains of simple softening, is confuted by the author, who affirms, that in proportion to the depth of the red or ochrey shade, so is the certainty of their being the remains of sanguineous effusion.

2. *Sanguineous infiltration.* This form recognizes the same cause as the former, namely, a molecular change in the part. On this subject, the author makes the very important remark, that redness of the medullary substance cannot be considered a sign of inflammation, for inflammation never produces redness of the medullary, and seldom of the cortical portion. When sanguineous infiltration is present, the brain has a dotted appearance, similar to that which is observed in the vicinity of an apoplectic clot. This is the capillary apoplexy of Cuvier.

3. *Inflammatory softening.* The most important character of this lesion is the presence of pus. This may be easily recognized by sight, or by the simple expedient of pouring upon it a stream of water, which washes away the softened portion; an effect which it does not produce in the hemorrhagic form. Whenever redness is observed, it is an indication of extravasation of blood and not of inflammatory softening.

The author concludes by reiterating his belief that of 100 cicatrices found in the brain 98 are due to hemorrhage, and the other 2 to any other lesion rather than "ramollissement."

ART. 9.—*On the Treatment of Epilepsy.* By E. BLACKMORE, M.D. Edin. Physician to the Bath Penitentiary.

(*Med. Gazette*, March 1845, p. 725.)

"In all cases, in the paroxysm, whether there be turgescence of the vessels of the head, or pallor and coldness of the face, in the delicate and in the robust, in the recent and in the confirmed disease, the cold affusion is probably the best remedy; if bleeding be practised, it should be far less extensive than in apoplexy; when excessive, it has only been the means of substituting one form of convulsion for another, or of inducing worse consequences. In that form of the disease which is caused by a stroke of lightning, or sun-stroke, or from a large quantity of spirituous liquors taken at a draught, experience shows that the best treatment consists of cold water affusion, followed by an emetic and ammonia, as soon as the power of swallowing has been recovered; bleeding in such cases has been fatal. Besides the cold douche, a clyster of turpentine is alone required in most cases. Compression of the carotids has also been found useful.

"In the intervals of the fits, the most generally curative treatment, in a vast number of cases which I have seen in practice, has been the antiphlogistic, either evacuant or sedative. Small bleedings and cupping, shortly before the period of the return of the paroxysms, has had a most salutary effect; while profuse bleeding has served to make the returns more frequent.

"Purgatives are especially valuable, e. g., elaterium and croton oil. I have given also, with good effect, a scruple dose of calomel. In relaxed habits a combination of colocynth with the gum resin of cornel has succeeded well. The oil of turpentine is a most useful adjunct in these cases to castor oil.

"Emetics, particularly sea-sickness, have appeared safe and wholesome. Drains, such as the issue by incision on the occiput, are of an unquestionable utility in most cases.

"Sedatives, as colchicum and digitalis, have been often successful; but when incautiously given productive of equal mischief.

"In many cases of chronic epilepsy, the most successful treatment is not evacuant or sedative, but tonic,—not that tonic plan which fills the vessels with blood, but that which increases their contraction, and equalizes the general circulation. Of this class, the more successful in my experience, is turpentine in small repeated doses; the sulphates of copper and zinc, and nitrate of silver appear to act in a similar manner to turpentine, but not so efficaciously.

"When the fits have usually recurred in the night, the habit has been broken by an opiate given at bed-time, and by the patient being awakened and caused to leave the bed.

"*Concubitus rite et legitime peractus* has proved a remedy, just as its abuse has been one of the worst excitants of the malady."

ART. 10.—*On the Remedial Powers of Incisions of the Scalp:*—[The long incision of the scalp which, as may be remembered, was introduced by Dr. Wallis, has been for the most part considered so unnecessarily severe, that it has found but few admirers; and since the publication of the paper of the originator of the operation, and of another by Dr. Oke, of Southampton, (*Provin. Med. Jour., Sept.* 18, 1844,) we do

not recollect that its usefulness has met with any corroboration. The proceeding recommended by Dr. Blackmore is of a less formidable character, and will, doubtless, be found to be worthy of a portion at least of the eulogium he has accorded to it]:—

"I would urge on the attention of the profession the importance of a remedy which I have lately used several times with considerable success, namely, a deep incision of the scalp, allowing the wound to bleed freely. In spasmodic cases of an encephalic kind, as well as in hemiplegia and mania; when there has been either a fixed pain in the head or a tender portion of the scalp, so that gentle percussion has induced great pain, or a convulsive or an hysterical fit, my experience, so far as it has gone, has proved that the bleeding from a free incision is a far more powerful remedy than any other mode of depletion. This practice should not be confined as formerly to cases of disease in the pericranium, nor should it be adopted merely as a last resource in chronic affections of the brain and its membranes, nor as a first step to the making of the enormous issue lately recommended by some distinguished physicians. The severe extent to which this mode of forming an issue has been carried, may bring an important measure into undeserved neglect. A purulent drain with seventy peas in the scalp would be intolerable to many persons who would readily submit to a cut three inches in length, and a turpentine dressing for a few days. My attention was called to this measure by (the late) Dr. Abercrombie, who had long used it with great success in cases where with symptoms of internal disease some portion of the scalp had become tender. I would submit, however, that it should not be restricted to such a condition, and that it might be extensively employed as a most efficient means of local bleeding."

Medical Gazette, March 1845, p. 723.

Art. 10.—*Treatment of Neuralgia by Narcotic Inoculation applied to the Nerve.* By Mr. Rynd.

(*Dublin Medical Press*, March 12th, 1845.)

[Two cases, which we extract verbally from the Reports of the Meath County Hospital, afford us a useful suggestion in those rebellious neuralgic affections which too frequently baffle the best-devised system of internal medication]:—

"Margaret Cox, æt. 59, of spare habit, was admitted into the hospital, May 18th, 1844, complaining of acute pain over the entire left side of the face, particularly in the left supra-orbital region, shooting into the eye, along the branches of the portio dura (?) in the cheek, along the gums of both upper and lower jaw, much increased in this situation by shutting the mouth and pressing her teeth close together, and occasionally darting to the opposite side of the face, and to the top and back of her head. She states that about six years ago she fell from a wall, and, in the act of falling, a stone struck her in the temple; that twelve months after this she was much exposed to cold, and one night was suddenly seized with the most agonizing pain in the situations above described. 'She thought her eye was being torn out of her head,' and her cheek from her face; it lasted about two hours, and then suddenly disappeared on taking a mouthful of ice. She had not had any return for three months, when it came back even worse than before, quite suddenly, one night on going out of a warm room into the cold air. On this attack she was seized with chilliness, shivering, and slight nausea; the left eye lachrymated profusely.

and became red with pain; it went in darts through her whole head, face, and mouth, and the paroxysm lasted for three weeks, during which time she never slept. She was bled and blistered, and took opium for it, but without relief. It continued coming at irregular intervals, but each time generally more intense in character, until at last, weary of her existence, she came to Dublin for relief.

"She had been salivated three times, and had been so much in the habit of taking laudanum that latterly half a drachm, three times in the day, had no effect in lulling the pain, and was the quantity she commonly took. She was a miserable sallow-complexioned looking creature, had been sleepless for months, and her face was furrowed with constant pain.

"On the 3d of June a solution of fifteen grains of acetate of morphia, dissolved in one drachm of creosote, was introduced to the supra-orbital nerve, and along the course of the temporal, malar, and buccal nerves, by four punctures of an instrument made for the purpose. In the space of a minute all pain (except that caused by the operation, which was very slight,) had ceased, and she slept better that night than she had done for months. After the interval of a week she had slight return of pain in the gums of both upper and under jaw. The fluid was again introduced by two punctures made in the gum of each jaw, and the pain disappeared. After this the pain did not recur, and she was detained in hospital for some weeks, during which time her health improved, her sleep was restored, and she became quite a happy looking person. She left the hospital on the 1st of August in high spirits, and promised to return if she ever felt the slightest pain again. We conclude she continues well, for we have not heard from her since."

Case II.—"R. Dolon, æt. 28, a thin spare man of middle stature, was admitted into hospital 9th September, 1844, and came under Mr. Rynd's care on the 10th November, complaining of acute pain in the right hip, thigh, and leg, to the sole of the foot, along the entire course of the sciatic nerve and its branches, but chiefly in the main trunk of the nerve. He is unable to sleep from the pain, and quite unable to walk. He is much emaciated, and the muscles of the limb are attenuated and wasted. He has been ill for three years, during which time he has been almost always confined to bed. He has been frequently treated for the disease with calomel, to produce salivation, cupping, blistering, leeching, &c., all without any salutary effect. Exposure to cold and wet is assigned as the cause of the disease.

"On the 13th of November the fluid was introduced, ten grains acetate morphiæ to the drachm of creosote by one puncture behind the trochanter, and one half-way down the thigh. He was instantly relieved from pain, and walked steadily through the ward without any pain or difficulty; before, walking increased the pain. For about half an hour after the operation he felt uneasiness from the puncture.

"16th. Says he is perfectly well in the thigh, and feels only a slight pain in the course of the anterior tibial nerve. The fluid was again introduced to-day to the seat of pain by two punctures; it disappeared as before.

"29th. Says he is perfectly well; has walked every day since; has slight stiffness in the knee from previous want of use.

"Ordered,—Camphorated oil to rub the knee with.

"December 15th. Left hospital to-day, saying he felt perfectly free from all pain and uneasiness.

"February 6th. He walked up to Dublin to-day, (twenty miles,) and

says that since the last operation, on the 16th of November, he has never felt his old pain, and is perfectly well."

ART. 11.—*On the Treatment of Neuralgia by Tobacco:*—After curing two cases of neuralgia by an infusion of tobacco, Mr. Chippendale, for convenience of application, devised an ointment which is made as follows:—Take of the best shag tobacco four ounces; distilled water two pints, boil for two or three hours, strain, and then wash the tobacco in two pints more of boiling water, strain a second time, and add it to the former liquor; then evaporate to the consistence of an extract. One part of the extract is added to seven parts of simple cerate to form an ointment.

Lancet, March 1, 1845.

SECT. III. DISEASES OF THE RESPIRATORY SYSTEM.

ART. 12.—*On the Pathology of Phthisis Pulmonalis.*

By S. EVANS, M.D., Physician to the Jarvis-street Hospital, &c. Dublin.*

[The following observations occur in a work recently published upon the fruitful theme of consumption, which is remarkable for the enunciation of several startling innovations upon our recognized notions of the pathology of the disease. The author thus expresses the conclusions to which he has arrived]:—

1. That phthisis pulmonalis is a disease characterized by deficient force of growth, together with symptoms, both local and general, of active pulmonary congestion.

2. That the preponderance of the white tissues in this disease is due to a diminished force of growth, whereby the tissues generally, but the red in particular, are rendered incapable of attracting from the blood their normal quantity of aliment, and by which their power of resisting the decomposing influences of external agencies is diminished.

3. That the diminution of the force of growth depends upon abstraction of the natural stimuli and aliment: for example, want of heat, air, light, oxygen in the blood, &c., and the food being insufficient and innutritious.

4. That the active pulmonary congestion may display itself in the form of bronchitis, hemoptysis, or pneumonia.

5. That the symptoms of active pulmonary congestion in this case, are hectic fever, emaciation, catarrh, cough, altered voice, together with derangement of the digestive and uterine functions.

6. That the same causes which produce the symptoms of phthisis, are likewise apt to produce the secretion of what is called tubercle.

7. That the parts of organs which have secreted tubercle, are subsequently disposed to ulcerate and suppurate, and the tubercle, at the same time, to soften in part into a fluid similar to pus.

8. That abscesses, formed by the softening of the tubercles, and the ulceration and suppuration of surrounding parts, are subject to the ordinary laws of abscess, viz., burrowing to, and bursting from, the surface which presents the least resistance, following. the least organized track in their fistulous course and cicatrizing by means of a lining membrane.

* Lectures on Pulmonary Phthisis. 8vo. Dublin, 1845.

9. *That the existence of tubercles is not signalized by symptoms, nor their absence a cause of amelioration in disease.**

10. That the presence of tubercles never causes inflammation in the surrounding tissues.

11. That hemoptysis when profuse, may be the cause of the diminished growth, and pulmonary irritation of phthisis. (p. 32.)

ART. 13.—*On Counter-irritation in Phthisis*:—[Dr. Evans having in early life been connected with the notorious St. John Long, possessed the most extensive opportunities of testing the value of stimulating liniments,&c. in phthisis pulmonalis. Contrary to what might have been expected, the author, who has since spent several years in the diligent study and practice of the profession, is inclined to think that the value of this means of treatment is much underrated, and that the fatal consequences which so often occurred under the hands of the charlatan were due to his want of discrimination in the application of his heroic frictions, and not to their inherent unsuitableness to the nature of the disease. After explaining the principles upon which the beneficial effects of counter-irritation are founded, the author thus proceeds]:—

"To diminish by proper means the original irritation, and to stimulate some other part where a secondary irritation exists. That this may become more energetic than the original, taking care that this new seat of disease shall be so far distant from the first, that the primary irritation may not be increased by the contiguity of the second; these are the chief elements that you have to bear in mind in the employment of the remedy. To effect these purposes, you ought, in the first place, to use such local and general depletion as circumstances may require, together with those contra-stimulants which are best calculated to diminish irritation; and having in this manner reduced the original irritation, you can convert it into a mere secondary affection, by exciting a more severe inflammation elsewhere. Then it will follow the ordinary laws of secondary irritations, and gradually disappear in proportion as what is now the principal disease progresses towards cure.

"It is in consequence of the neglect of these principles that counter-irritation so often fails. Recollect, therefore, that unless you can produce a *greater irritation* on the surface than that which exists internally, you will only do mischief by applying a stimulus to the skin."

[The author prefers a liniment composed of vinegar and spirits of turpentine, croton oil, or the ointment of tartrate of antimony, and particularly urges the necessity of applying the liniment extensively, which was the secret, as the author states, of the undoubted success in many cases, of St. John Long.]

Ibid., p. 139.

ART. 14.—*On the frequent spontaneous Cure of Pulmonary Consumption, and the indications furnished by Pathology for its rational treatment.* By D. H. BENNETT, M.D., F.R.S.E., &c.

(*Edin. Med. and Surg. Journal*, April 1845, p. 406.)

[The experience of every day tends more and more to the belief that, although we are not as yet able so to arrange our remedial agents as to bring

* [The italics are our own.—ED.]

about so desirable an event in a given case, the cure of pulmonary tubercles is not by any means so rare as is generally supposed. Pathological examinations continually reveal appearances which can only be referred to the former existence of tubercular deposit, and which no symptoms during life had given reason to suspect. The present paper, from the pen of a gentleman already favorably known to the profession, is an endeavour to deduce a rational mode of treatment from what appears to be the proceedings of nature in certain cases; and under the conviction that it is only by philosophical investigation, such as the present, and not by the charlatanerie with which every honorable mind has lately been disgusted, that we shall ever advance towards the successful treatment of phthisis, we shall condense the following paper as little as is consistent with the plan of this work.]

Every one who has been much accustomed to make post-mortem examinations, must occasionally have noticed puckerings or contractions in the substance of the lungs, sometimes conjoined externally with white cicatrices, sometimes with cretaceous or calcareous concretions. It is certain, from the frequency with which these appearances are met with, that, if they indicate the previous existence of tubercle, this lesion must not only heal spontaneously in a few cases, but must be a very frequent occurrence. This will appear to be the case from the following statement:—

Of 73 bodies which the author examined since last November, he found puckerings or concretions in 28; in 12 of these, induration alone coexisted; in 16, calcareous concretions were also present.

In 100 bodies examined by M. Rogee,* at the Salpêtrière, these lesions were discovered in 51, or more than half. M. Boudet† also states, that of 135 bodies examined by him, he found them in 116, or in about four-fifths of the whole.

In the 28 cases first alluded to, 3 were of the age of 18; 6 between that age and 40; and 19 above the latter age. There can be little doubt that they are most common in elderly individuals who have escaped the diseases incidental to youth.

It may be well, before we proceed further, to inquire whether the lesions now alluded to are really proofs of cured tubercular deposits in the lungs. This seems to be established by the following facts:—

1. A form of indurated and circumscribed tubercle is frequently met with, gritty to the touch, which, when dried, closely resembles cretaceous concretions.

2. The concretions are found exactly in the same site as tubercle; they are most common in the apex, in both lungs.

3. When a lung is the seat of tubercular infiltration throughout—recent tubercle occupying the inferior portion, and older tubercle, and perhaps caverns, the superior—the cretaceous and calcareous concretions will be found at the apex.

4. A comparison of the opposite lungs will frequently show, that whilst on one side there is firm encysted tubercle, partly transformed into cretaceous matter, that on the other the transformation is perfect.

5. The puckerings found without these concretions exactly resemble those in which the latter exist. Moreover, whilst puckerings with gray induration may be found in the apex of one lung, a puckering surrounding a concretion may be found in the apex of the other.

6. The seat of cicatrices admits of the same exceptions as the seat of

* Archives Générales de Médecine, vol. v, 1839. † Comptes Rendus, tom. vi, 1843.

tubercles. In one case the author found the puckerings in the inferior lobe only; he has also met with three cases in which the lower lobe was densely infiltrated with tubercle, the superior being only slightly affected.

Hitherto these lesions have been considered as occurring very seldom. Laennec only records six cases; Andral, eight; and various writers have published isolated cases as remarkable for their rarity. Dr. Williams* speaks of these appearances as *now* and *then* and *sometimes* occurring. Such is the general belief.

On the other hand, the observations of Rogee and Boudet, confirmed by those of the author, will probably serve to show that this spontaneous cure of tubercle has occurred in from one third to one half of all who die after forty.

This result may with some excite surprise as being contrary to the prevailing opinion; but it is easy to show that there is nothing in the chemical constitution of tubercle which differs from lymph in the early stages, only in containing more albumen, and as the latter forms a superabundance of earthy salts,—that should in any way oppose the facts revealed by morbid anatomy.

Tubercle is not malignant. Gulliver and Vogel, it is true, have described it as composed of nucleated cells, but, after careful examination, the author has never been able to discover such a formation. On this point the observations of Lebert more nearly agree with those of the author, which have always shown that tubercle is composed of granules, and corpuscles of irregular shape, difficult to be described, but easily recognized by an experienced eye.

Then with regard to the action upon which tubercular deposition depends, two opinions have been contended for. By some, it is maintained to be a constitutional disease; by others, to be the product of inflammation. Great names are ranged on either side. A moment's consideration will show that the whole discussion turns upon what is meant by inflammation. If by that term be understood pain, heat, redness, &c., then tubercle is not inflammatory. If, on the other hand, we consider that the essential phenomenon of inflammation is an increased exudation of blood-plasma, then tubercle must be regarded as an inflammatory product.

What then, we ask, constitutes the difference between the products of ordinary inflammation and tubercle? It is the comparatively inorganizable power of the latter. In tubercle, we have granules and imperfect cells; in the products of healthy inflammation, we have granules and perfect cells. Both these morbid products are formed by the exudation of the blood-plasma. If it undergoes transformation into perfect organism, it constitutes what pathologists have in some cases called the results of inflammation, in others, different kinds of tumours. If the transformation be arrested or rendered imperfect, it forms what has been called tubercle or scrofulous deposits. The essential distinction, then, between the products of inflammation and tubercle, must be sought for in a difference of composition (chemical and vital) of the blood-plasma. Hitherto chemistry has not taught us in what this difference consists, but has pointed out the probability of its consisting of some form of proteine less capable of organization than fibrine. The deficiency of organization is readily seen under the microscope.

The fact, then, of the frequent spontaneous cure of tubercle may be ad-

* Diseases of the Chest, 4th Edit. p. 192.

mitted. Laennec, Andral, Cruveilhier, Rogee, Boudet, &c. have each published cases where all the physical signs of the disease, even in its advanced stage, have existed, the patient, nevertheless, dying after many years of another disorder, and in which puckerings and concretions were found after death. Boudet states that in one year he met with fourteen cases where softening of tubercular matter in a cavern was evident, all traces of which subsequently disappeared. So deeply rooted, however, is the opinion of the necessarily fatal nature of this disease, that, simply because recovery has taken place in certain cases, medical men have rather mistrusted their own diagnosis, than ventured to oppose a dogma of universal belief.

The treatment of pulmonary consumption has for the most part been empirical: one remedy after another has failed, because no one remedy can be of use in a disease which, from its commencement to its termination, presents such different characters and indications. These characters and indications are only to be ascertained by a practised auscultator, and the signs which guide his practice are totally inapplicable to others who cannot distinguish them. Empirical means having failed to accomplish a cure, perhaps a study of the method in which nature operates may be more successful. The facts which have been brought forward at various times hold out every encouragement for prosecuting a rational treatment of the disease, based on its general pathology. For this purpose, a knowledge of the progressive march of tubercular depositions, is of primary importance.

At first, tubercle is deposited in a fluid state from the capillaries, in the same manner as lymph. The miliary and infiltrated forms, whether gray or yellow, after a time soften—a process which may commence at any part of the mass and gradually involve the whole. The parenchyma of the lung, or the pleura in the immediate neighbourbood of such deposition, is more or less inflamed. The pleura especially obtains a thickness unknown in other diseases, so much so as in some instances to acquire a cartilaginous hardness, and to form a complete capsule all round the tubercular deposit. This capsule is often so firm as not to collapse when the tubercular matter is evacuated, so as to leave a cavity. When further tuberculization is checked, and the powers of the system are sufficiently entire, this cavity contracts, its walls unite or close upon the tubercle, which has undergone the transformation presently to be described, and a cicatrix is formed.

Cicatrices present different appearances accordingly as the cavity from which they are formed is superficial or deep-seated. In the first case, adhesion takes place between the pleuræ, and the summit of the lung is drawn close to the thoracic walls. More frequently, however, the cavity is deeper, in which case the walls of the cavity contract inwards, producing a puckering of the external surface.

Sometimes no traces of tubercular matter are to be found either within or in the vicinity of these cicatrices. More generally, however, the reverse will be found to be the case. Occasionally the tubercular matter exists in round encysted masses, of a composition containing an abundance of earthy salts and crystals of cholesterine. Sometimes the greater portion is absorbed, leaving only a small residue; at others, the whole is converted into a solid calcareous mass. This may remain an indefinite time, or may be evacuated with the sputa. In the latter case, the walls of the cyst contract into a dense linear cicatrix.

If, then, no further deposition of tubercle take place, there is no reason why this process, which is the analogue of that which takes place in ordi-

nary abscess, should not occur as frequently as the healing of ulcers and abscesses in other internal organs. To accomplish this, we must overcome the pathological conditions upon which the deposition of tubercle depends. These are, *first*, a morbid state of the blood; and secondly, local inflammation; by means of which an unhealthy exudation is poured out, which takes the form of scrofulous or tubercular matter.

The indications for treatment, therefore, are, first, to overcome the dyspepsia and acidity of the alimentary canal; secondly, to furnish the material necessary for the formation of healthy chyle; and thirdly, to combat the local inflammation.

The principal difficulty in the treatment will be found to consist in removing, at the same time, general imperfect nutrition and debility, and the local inflammation, and the irritability depending upon it.

The dyspeptic symptoms are sometimes to be alleviated by naphtha, when all other ordinary means have failed. The boasted good effects of this remedy are, I think, attributable to its great power in allaying irritability of the stomach, and thus enabling the patient to take nourishment.

The imperfect nutrition will be best overcome by an easily digestible and nutritious diet; milk, substances which abound in oleaginous rather than albuminous principles, and an equable warm climate, whereby an excess of oxygen may be diminished. In following the second indication, I can now, after four years' experience, strongly recommend the cod-liver oil as a most valuable remedy.

The local inflammation must be combated by topical bleeding and counter-irritation. Some of these remedies are of course more valuable than others, and all require tact, guided by a perfect knowledge of the physical changes which take place in the lungs. The treatment must also be modified according to the stage of the disease.

Whatever opinions may be held, however, with respect to the value of the treatment proposed, it will, perhaps, be conceded, that the facts now brought forward are sufficiently important to warrant new trials, directed rather to the curative than to the palliative treatment, which is now so prevalent.

Art. 15.—*Remarks on Pulmonary Phthisis in the Young Subject.* By Dr. Hennis Green.

(*Medico-Chirurgical Transactions*, vol. xxvii, 1844.)

[The author of the present paper is well known to the readers of the various journals for the intelligence with which he has illustrated many of the more obscure points of infantile pathology. The object of the essay of which we shall endeavour to give an abstract is to pourtray certain differences which exist between pulmonary tubercular disease, as observed in the adult, and the phthisis of children]:—

The main character which forms this distinction is, that in the latter, the tubercular matter is more extensively, and at the same time more rapidly secreted than in the adult. Hence children often sink under the disease before it has arrived at its more advanced stages.

The morbid appearances depending upon tubercle in the child do not offer any striking peculiarity, with the exception of the caverns, which appear to be found more frequently situated in the lower lobes of the lung than the upper. This is especially the case in children under five years of age; thus, in 11 cases of that age the cavern was situated in the superior lobe in

only 3. As the child approaches the age of twelve, the situation of the cavern becomes the same as in the adult.

Symptoms. In describing the symptoms of phthisis in children, it is necessary, according to the author, to distinguish two forms of the disease: one which is identical with that which is seen in the adult; the other which appears peculiar to infantile life. The latter consists in the deposition of gray granulations and yellow infiltration, with anfractuous cavities in the lower or middle lobes, as already alluded to. The form of the complaint is usually acute from the beginning; the child has irregular accesses of fever, with heat of skin, accelerated pulse, and flushed cheeks, the rest of the face being pale and haggard. The abdomen is often tumid, and the bowels are irregular, the appetite fails, and emaciation sets in. There is a short dry cough, but no expectoration. The physical signs are few and uncertain. When the tubercular matter is sufficiently accumulated in the upper lobes, we have a certain roughness in the respiratory murmur, and prolonged expiratory sound; but these sounds are frequently masked by the existence of other lesions of the chest. In fact the physical signs are rarely so well marked in the child as in the adult, the patient frequently dying before the practitioner has been able to decide whether there is actually a cavern or not.

The rational signs of phthisis in the child present also certain modifications. The cough is often absent altogether, and still more frequently inconsiderable; the respiration is not much quickened in the first instance, but subsequently becomes greatly accelerated, amounting in some cases to eighty in a minute. The expectoration, unlike that of the adult, furnishes but slight means of diagnosis. Hemoptysis is an exceedingly rare symptom in infantile phthisis, as has been remarked by Sir J. Clark and Rilliez and Barthez; in the author's practice it occurred only five times in one hundred and twelve cases. This point offers a striking contrast to the case of the adult, in which, according to Louis, it is present twice out of three times.

Diagnosis. Allusion has already been made to the uncertainty of the diagnosis in many cases of infantile consumption. It is sometimes extremely difficult to distinguish it from lobular pneumonia, and we shall frequently have to wait before we shall be able to decide whether the symptoms depend upon ordinary pneumonia, or that insidious form which is accompanied by tubercle and tubercular infiltration. The main points of difference, as pointed out by Rilliez and Barthez are, 1st, their progress and duration: lobular pneumonia generally extends to the neighbouring portions of the lungs in a few days, and its signs become more positive, while those of tubercle continue stationary for a much longer period. 2. The period at which bronchial respiration occurs; in simple pneumonia being at an early stage, in tubercle at a more advanced one. 3. The seat of the bronchial respiration; in tubercular disease frequently at the summit of the lung; in lobular pneumonia, more often in the middle or lower lobes.

The bronchial glands are implicated in a great majority of cases of infantile consumption (in 100 out of 112 cases). In a few of these cases only were the glands sufficiently enlarged to give rise to symptoms through their mechanical effects, or by communicating with caverns in the lungs or bronchi. To such cases only should the term *Bronchial Phthisis* be applied. Thus understood, this form of phthisis is peculiar to children but is not so common an occurrence as has been supposed.

The symptoms of tuberculated bronchial glands are mainly mechanical. The aorta, pulmonary artery, vena cava, &c., may be compressed, and the flow of blood more or less impeded. Hence may arise pulmonary apoplexy, and effusion of serum. When the lower part of the trachea is compressed, MM. Rilliez and Barthez have noticed a loud persistent sonorous râle. In other cases an intermittent feebleness of respiratory murmur is observed.

Pressure on the eighth pair causes a peculiar modification, sometimes amounting to complete extinction of the voice. The cough in such cases closely resembles that of whooping-cough.

The *diagnosis* of this form of phthisis in children must be founded on the preceding peculiarities in the progress and history of the symptoms. Whenever a child presents several of the rational signs of consumption, without our being able to detect the presence of tubercles in the lungs or abdomen, we have good reason to suspect that the bronchial glands are affected. As long as the case continues to present this simple aspect, we cannot go beyond suspicion; but it rarely happens that the glands acquire a considerable degree of development, without acting upon the neighbouring tissues. As these become successively involved, we have a series of varying symptoms, which could not arise from any other source. The eyelid becomes œdematous, and in proportion as the vena cava is compressed, the œdema extends to the whole face, which is either pale or livid. The characters of the cough and voice have already been mentioned; but we may state in addition that the child is liable to attacks of suffocative dyspnea.

The physical signs are loud sonorous râle, either persistent, or replaced by other anomalous sounds. When these symptoms are superadded to the rational signs of phthisis, we can have little hesitation in deciding that they arise from tubercular enlargement of the bronchial glands.

Treatment. Upon this point the author has little to offer. He however makes the remark that in children the emetic treatment should not be adopted, lest irritation of the abdominal viscera hasten the deposit of tubercle in the abdomen, to which the patients are already too prone. As a general rule, he considers the prognosis, under favorable circumstances, more encouraging than in the adult.

Art. 16.—*On the Operation of Paracentesis Thoracis.*

By Hamilton Roe, m.d. Oxon. Physician to the Westminster Hospital, &c.

(*Medico-Chirurgical Transactions*, Vol. xxvii, 1844.)

The operation of tapping the chest in chronic pleurisy and hydrothorax has long been a fruitful theme of discussion. The balance of opinion has in general been unfavorable to it as regards the cure of the diseases for which it is recommended, but the support of such names as Larrey, Frank, Bell, Williams, Copland, &c., may fairly be adduced as a reason for a dispassionate inquiry into its real merits. Such an inquiry we find in a paper read before the Medico-Chirurgical Society by Dr. Hamilton Roe, which, as it is replete with practical information, we shall endeavour to condense for the benefit of such of our readers as have not access to the original.

The author opens his communication by an examination of the principal objections which have from time to time been urged against the operation. One of these is, that it frequently induces dangerous syncope; that it is of little use in peritoneal effusions, and therefore by analogy cannot be of more service in effusions into the pleura; and that as it does not cure the

inflammation which gives rise to the effusion, no object is attained by merely removing the fluid. In answer to this, the author replies that in thirty-nine cases, which he gives in a tabular form, syncope did not occur once; that the observation respecting peritoneal dropsy is false, and that the operation is not recommended until inflammatory symptoms have ceased.

Another objection, and one which has the support of many great names, is, that the admission of air into the cavity of the chest gives rise to dangerous and frequently fatal symptoms. Dr. Roe decides this objection also to be without weight, for in every case which has fallen under his observation, "a considerable quantity of air entered into the pleura during the operation, and in some of them so freely, as to excite all the physical signs of pneumothorax, but in none of them did it produce any permanently evil effect; in one instance only did it cause even temporary inconvenience."

The last objection noticed by the author, is, that the operation is unnecessary, as all cases really curable are curable without paracentesis. This was the opinion of the late Dr. Hope, founded upon the analysis of thirty-five cases. In answer to this the author inquires what is meant by cure. If by it is meant not only the removal of the fluid but the return of the lung to its normal state, he denies the power of internal medicines. The objection is also untenable for the reason that the operation is not proposed until the failure of medicines, the principal of which is mercury, points out the necessity for some ulterior proceeding. To spend much time in the endeavour to promote absorption when that process appears to be tardy in making its appearance, is injurious to the patient, as it allows the lungs and pleuræ to undergo those irremediable changes which render their restoration impossible. For these reasons Dr. Roe observes that less harm is inflicted by tapping than by the sole reliance upon internal medicines.

The objections, therefore, to paracentesis are reduced to this; that it inflicts a wound; whilst in favour of it, it may be said that in empyema it at once removes a noxious fluid, and by its early adoption prevents the irremediable changes above noticed.

Having disposed of the objections which are ordinarily brought forward by the opponents of paracentesis, the author in the next place proceeds to point out the forms of disease to which it is applicable, and the indications for its performance.

The term empyema is limited by him to those cases in which the contents of the pleural sac are purulent; hydrothorax being applied to serous effusion whether inflammatory or consecutive to disease of other organs. In empyema the operation is indicated in those cases which do not yield quickly to ordinary treatment, and its advantage is shown by the proceedings which nature sometimes adopts in similar cases. When the fluid is once clearly ascertained to be purulent, the operation should be performed without loss of time.

In serous effusions, in which the life of the patient is threatened by the rapid accumulation of fluid, paracentesis is admitted to be the only remedy. It will also be frequently necessary in serous effusions occurring in scrofulous habits, in which the necessary treatment has either failed or been neglected. In mechanical hydrothorax the operation is only palliative, as the cause of the effusion being organic, it is impossible to prevent its re-accumulation.

In order that the operation should have the greatest possible chances of success, it is indispensably necessary that it should be employed before

either the constitutional powers of the patient are too much reduced, or the thoracic viscera have undergone irremediable organic changes, for in the former case the absorbents cease to perform their functions, and therefore cannot prevent the re-accumulation of the fluid; and in the latter a cure is impossible, for the lung being condensed by the pressure of the fluid, and bound down by adhesions, cannot re-expand. In respect of the necessity for performing the operation early in order to ensure success, paracentesis resembles many other operations, such as laryngotomy, the operation for strangulated hernia, &c.

It would be very desirable to fix, if possible, the precise period beyond which the operation ought not to be delayed. There can be no doubt that it should be before the changes in the lung have taken place, but the exact point of time is not easily determined. Dr. Roe considers that the operation should be performed as soon as the acute symptoms of pleurisy have subsided, which, as a general rule, he thinks, happens within three weeks from the commencement. The exploring needle will be found a most valuable instrument in determining the nature of the effusion previous to the tapping.

The operation. Some difference of opinion exists as to the manner in which the operation should be performed, and the quantity of fluid which should be evacuated at one time. Formerly an incision was made into one of the intercostal spaces, the fluid was evacuated at once, and the wound was left open. More recently the opening into the pleura has been made with a trochar, the wound being kept open or closed immediately. The two former modes are objectionable, as it allows the admission of air, which, though, as before stated, it is not immediately injurious, may become so by constant ingress. In the cases alluded to in the table, the opening was made with the trochar, and closed immediately after the evacuation of the whole of the fluid, and if it re-accumulated the operation was repeated. This Dr. Roe looks upon as the best mode of proceeding.

In the twenty-four cases witnessed by Dr. Roe the opening was made as recommended by Laennec, in the space between the fifth and sixth ribs, a little posterior to the digitation of the serratus magnus. The skin being previously drawn downwards so as to make the opening valvular, a deep incision was made, and a sharp trochar and canula were afterwards passed inwards and upwards with sufficient force to puncture the pleura Any inflammatory symptoms which might arise were combated by extensive dry cupping, and the internal administration of small doses of mercury.

Diagnosis of pleuritic effusion. Cases are on record in which the sound side has been tapped instead of the diseased one, to the certain destruction of the patient, by the production of pneumothorax on the side opposite to the one containing the effusion. Such a mistake in the present day would be unpardonable, as effusion in any quantity ought to be readily recognized even by the inexperienced auscultator. When however the fluid exists in small quantity, it may be overlooked from the following causes :—the fluid as a matter of course gravitates to the most depending portion of the chest, and therefore on the left side, may be obscured by resonance given out by a distended stomach, and on the right may be mistaken for the liver, if the dull sound on percussion alone be taken as a guide. The former difficulty may be cleared up by percussing lightly over the suspected effusion, by which means the resonance of the stomach will not be elicited. The mistake on the right side can only be rectified by the possession of an accurate knowledge of the exact height to which the liver rises.

Dr. Roe mentions, as a valuable diagnostic sign in addition to dulness on percussion, a marked degree of fulness, or even protrusion, of the infra-clavicular space in the affected side. He does not consider bulging of the intercostal spaces so conclusive and invariable a sign of copious effusion as has been generally imagined, especially in serous effusion, although it is more constant when the contents of the chest are purulent, and is therefore more indicative of the quality than the quantity of fluid. The absence of the vibratory thrill, and the posture assumed by the patient are both estimated by the author at their proper value.

The author, in concluding his valuable paper, inserts a table of twenty-four cases which occurred immediately under his own inspection, and which certainly place the operation in a very favorable light. Of these eighteen recovered and six died; but this, as observed by the author, was a greater mortality than can be fairly laid to the charge of the operation, as one was from phthisis, another from pneumothorax, and a third from consecutive hydrothorax, in which of course the operation could only be regarded as palliative. Upon these considerations the author believes himself justified in stating, "that the operation is not more dangerous than any other which is performed upon the human body, and that the evil consequences supposed to attend it are imaginary rather than real, inasmuch as it was not only not fatal in one out of twenty-four cases, but did not produce even temporary inconvenience in any."

[A case is related by Dr. Thompson in the same volume, in which the operation of paracentesis was performed four times, and eventually with perfect success. The patient was a boy 6 years of age. Dr. Thompson advises the valvular opening, and the partial removal of the contents, especially when the discharge is purulent. He justly condemns the practice of leaving in the canula, which, as in a case related by Dr. Stroud, (*Med. Quart. Rev.*) is capable of converting a serous into a purulent effusion.]

Art. 17.—*On Iodide of Potassium in the Third Stage of Pneumonia.*

(*Philadelphia Exam. and Lancet*, Feb. 1, 1845.)

[Dr. Upshur states that he has administered the above remedy with remarkable success in many cases of pneumonia advanced to the third stage. He has found its use indicated.—]

1. In pneumonia occurring in anemic persons, where the disease is characterized in its early stages by typhoid symptoms. 2. In cases where inflammatory action, in the commencement high, has been reduced by antiphlogistic treatment and the suppurative stage is just beginning. This stage is easily recognized by a sudden depression of the vital powers, by a soft irritable pulse, and by bronchial respiration being accompanied by rough mucous rhonchi. 3. In those cases which are grafted on long continued intermittents, which have left the blood in a great degree impoverished.

SECT. IV. DISEASES OF THE CIRCULATING SYSTEM.

Art. 18.—*On the Treatment of Asphyxia.* By S. E. Erichsen, Lecturer on General Anatomy and Physiology at the Westminster Hospital.

(*Condensed from Edin. Med. and Sur. Jour.*, Jan. 1845, pp. 32-56.)

[The author, at the conclusion of a most able experimental Report upon the interesting subject of suspended animation, remarks as the result of his investigations, that one of the chief causes of the suspension of the circulation is the obstacle offered to the passage of the blood through the lungs, consequent upon the cessation of its arterialization, and the arrest of the respiratory movements; and that the contractions of the heart cease, and the functions of the brain and nervous centres become suspended, in consequence of the circulation of unoxygenized blood.]

The first object, therefore, should be to restore the arterialization of the blood, and the second to restore and maintain the heart's action, and thus cause the freshly aërated blood to circulate through the nervous centres; thus stimulating the functions of the *medulla oblongata* and nerves of respiration, by which the respiratory movements will in their turn be properly maintained.

In order to render the subject as clear as possible, the author divides the cases of suspended animation, into two very obvious groups:—

I. Those in which the action of the heart still continues, however feebly.

II. Those in which the action of the heart has ceased.

There is much misapprehension as to the length of time during which a person may be deprived of the power of breathing, as in submersion, and yet be saved. We occasionally hear loose statements to the effect, that life has been restored after ten and fifteen minutes' suspension of respiration, but it may be affirmed upon the best authority—that of the surgeon of the Royal Humane Society, that no cases have been saved which have been more than *four minutes* under water.

The means generally employed by the above-mentioned society for the restoration of the first class of cases consists in clearing the nose and mouth from obstruction; the application of heat by means of a bath at 100 degrees; the employment of brisk friction, and the application of the fumes of ammonia to the nostrils. In addition to this, Mr. Erichsen advises the sprinkling or dashing of cold water upon the face while the body is in the bath, for the purpose of exciting reflex respiratory movements. The lungs should at the same time be inflated by compressing the abdominal and thoracic walls strongly, and allowing them to recover their natural dimensions by their innate resiliency.

In the treatment of the second class of cases, in which the body is cold and the vessels are constricted, the first indication is naturally that of the application of warmth. But, says Mr. Erichsen, here two questions present themselves *in limine*:—

1st. What temperature is it advisable to employ?

2d. How is the warmth to be employed?

The Royal Humane Society recommend a bath of the temperature of 98 or 100°; but as Mr. Erichsen justly observes, allowance ought to be made for the season of the year in which the immersion takes place; that temperature would not, as the observations of M. Edwards demonstrate,

be safe in the winter when the temperature of the water in which the individual has been immersed is but little above thirty-two degrees. In this case the author recommends that at first the heat applied should not be greater than eighty-five or ninety degrees.

The next subject for consideration is an equally important one, viz., the nature of the medium through which the heat should be applied. The ordinary, because the readiest method, is the warm bath; but on this point the author agrees with Drs. Kay and Carpenter, that there is room for serious objection, as it is opposed to two well-known physiological facts, namely, that the integument even in man acts as a respiratory organ, and that the direct influence of air upon it acts as an excitor to respiratory movements. On these grounds, therefore, the author prefers the application of warmth by means of the *hot-air* bath.

Much difference of opinion exists as to the exact value of artificial respiration, and the best mode of applying it. Haller, Hunter, Goodwyn, Coleman, Bichat, Kay, Carpenter, and, indeed, almost every writer on asphyxia, have insisted on the paramount importance of supplying the blood in the pulmonary vessels with oxygen as quickly as possible. On the other hand, Sir B. Brodie, Mr. Dalrymple, and Mr. Woolley, have countenanced the discontinuance of artificial respiration in many cases in which it used to be employed.

In this divided state of opinion between men equally worthy of consideration, it will be useful to examine the subject somewhat in detail, and more particularly in regard to the following questions :—

1st. Can artificial respiration re-establish the circulation through the lungs after it has entirely ceased?

2d. Can it re-excite the contractions of the heart after they have entirely ceased?

That the first question can be answered in the affirmative, is determined by Mr. Erichsen by direct experiment, in which artificial respiration was not commenced until thirty-seven minutes and a half after the ventricles had ceased to beat, but the blood, nevertheless, became rapidly oxygenized, and passed freely into the left side of the heart. In this experiment, moreover, seventy-two minutes had elapsed after the closure of the trachea.

The second question is answered in the negative by the author in these words, " I can most distinctly state that I have never in any one instance been able by inflation of atmospheric air, to restore the contractions of the ventricles if they have once fairly ceased, notwithstanding that the blood in the pulmonary veins and left auricle became florid in a few minutes."

But although artificial respiration fails to re-excite ventricular contractions after they have ceased, are we on that account to discard its employment in asphyxia? The author thinks not, for if such direct means will not succeed, neither will the more indirect methods of warmth, friction, &c. The value, however, of artificial respiration, entirely depends upon the manner in which it is employed. How then ought it to be accomplished? Inflation by the mouth is objectionable, as it distends the lungs with air already charged with carbonic acid. The bellows, if properly used, are very useful instruments for the purpose, especially if provided with nostril tubes. But the safest, and at the same time a very effectual mode of introducing pure air into the lungs, is either by the means of the split sheet, as recommended by Leroy and Dalrymple, or else by alternately compressing the chest and abdomen, and allowing the former to expand by its own resiliency. The last mode has the advantage of closely imitating the natural process.

[It appears from the foregoing remarks, that in those cases of asphyxia, in which the heart's action has completely ceased, there is but little hope of restoring its contractions either by artificial inflation of atmospheric air, and *à fortiori*, not by friction, warmth, &c. alone. Are we then, supposing a person has been under water longer than four minutes, to leave him to his fate? The author very properly observes that some attempt at resuscitation should be made even in the most unpromising cases, and suggests that pure oxygen should be used instead of atmospheric air.]

Should symptoms of secondary asphyxia, such as stupor, laborious respiration, dilatation of the pupils, and convulsions manifest themselves, artificial respiration should be immediately resumed, until the action of the heart has been fully restored. In these cases, the author recommends slight electric shocks to be passed through the base of the brain and upper part of the spinal cord, so as to stimulate the respiratory tracts.

Art. 19.—*Clinical Remarks on the Diseases of the Heart.*

By O. B. Bellingham, M.D., Physician to the St. Vincent's Hospital.

(*Dublin Medical Press*, February, March, April, 1845.)

"*On the causes of valvular disease.* We have seen, in speaking of endocarditis and pericarditis, how often disease of the valves can be traced to an attack of acute rheumatism—indeed, many of the worst cases of valvular disease which we meet in hospital have their origin in this way; the accompanying inflammation of the endocardium having been overlooked at its outset, or detected only when irreparable injury had been inflicted upon the valves.

By some pathologists all the changes which occur in the valves and orifices of the heart are regarded as the result of inflammation; no doubt valvular disease very often arises from this cause, but to lay it down as a general rule that the alterations which we find in these parts are the result solely of inflammation of the endocardium, whether acute or chronic, is to take a much too exclusive view.

We have already sufficiently explained the manner in which the valves become diseased as the result of inflammation of the lining membrane of the heart; it remains now to notice some other causes capable of producing valvular disease.

Anything which excites the circulation, and keeps up increased action of the heart for a length of time, may prove a cause of valvular disease. It is evident that when the heart's action becomes stronger than natural, the valves have to support additional weight, or to bear increased pressure; and when the action of the organ besides being increased, is quickened, the valves have to bear this additional strain more frequently. Now, increased action in any part generally leads to increased nutrition, and the fibrous tissue of the valves may thus become thickened, which thickening may ultimately terminate in cartilaginous or osseous degeneration. It is in this way that intemperance, on the one hand, and violent exercise or strong mental emotion on the other, by hurrying the circulation, tend to develop valvular disease; though, probably, the latter do so only in persons who are in some measure predisposed to it. Hypertrophy of the muscular tissue of the heart obviously may, for the same reasons, become a cause of valvular disease; and even nervous palpitation itself may ultimately develop valvular disease, though this has been denied. But if the accessions of palpitation are frequent and

violent, undoubtedly hypertrophy, dilatation, or valvular disease might be the result. Here, as in the other cases mentioned, there is in the first instance an additional stress upon the valves, and they have to bear this more frequently than in health. Now, the muscular tissue of the heart may increase in thickness in order to meet this, or the frequent distension of the cavities may occasion dilatation, or the valves themselves may suffer. The knowledge of the fact that a case, which at first was one simply of nervous palpitation, might end in organic disease, should suggest caution in giving a very decided opinion, as the patient will be very apt to suspect that his disease had been so from the commencement, and that you had failed to detect it.

Valvular disease is also occasionally the result of congenital malformation; we have seen, in speaking of the morbid alterations found in these parts, that a cribriform condition of the semilunar valves of the aorta or pulmonary artery is by no means rare; such a state of these valves must necessarily permit regurgitation, and may ultimately have the same injurious effects upon the heart as are found to follow other lesions of the valves."

On the Physical Diagnosis of Valvular Disease. The abnormal sounds which accompany organic disease of the valves or orifices of the heart may be arranged under the heads obstructive and regurgitant murmurs, according as they have their cause in obstruction at one of the orifices of the heart, or in insufficiency of the valves which naturally close it; or systolic and diastolic murmurs, according as they accompany the ventricular systole, or its diastole. The obstructive murmur at the aortic orifice and the regurgitant murmur at the mitral orifice accompany the systole of the ventricle. The regurgitant murmur of the aortic orifice and the obstructive murmur at the left auriculo-ventricular orifice accompany the diastole of the ventricles.

The following table will, perhaps, make this subject more clear; it is nearly similar to one given by M. Littré:—

AORTIC ORIFICE.

Contraction of orifice—first sound, morbid; second sound, natural.
Insufficiency of valves—first sound, natural; second sound, morbid.

LEFT AURICULO-VENTRICULAR ORIFICE.

Contraction of orifice—first sound, natural; second sound, morbid.
Insufficiency of valve—first sound, morbid; second sound, natural.

The murmurs which accompany or replace the first sound of the heart, and are heard during the systole of the ventricles, differ in general from those which accompany or replace the second sound, in being louder, stronger, and more intensely blowing, or they may be rough and harsh, resembling the sounds of filing and sawing; whereas, the murmurs which accompany or replace the second sound, and are produced during the diastole of the ventricles, are usually softer and more blowing. This is owing to the much greater degree of force with which the blood is expelled from, than with which it enters the ventricle.

I shall now proceed to notice the auscultatory signs of disease at each orifice of the heart.

AORTIC ORIFICE.

Obstructive disease. In contraction of the aortic orifice, or in disease of its semilunar valves, occasioning an impediment to the passage of the blood out of the ventricle during its systole, the normal first sound is obscured or replaced by a bruit de soufflet, or by a rough, grating, or sawing

sound, which is loudest about the junction of the cartilage of the third rib with the sternum, which gives the impression of being superficial and near, is prolonged upwards for a short distance towards the neck, but is not audible at or below the apex of the heart. Disease of the lining membrane of the aorta may also occasion an abnormal murmur with the first sound wrthout any disease of the valves: this is usually more superficial, is audible higher up the neck, and is louder over the first bone of the sternum than opposite the semilunar valves. According to Dr. Hope, it may be known that the murmur proceeds from the aortic valves, rather than from the diseased ascending aorta, by its key not being higher than a whispered R, whereas a murmur from the aorta is commonly a tone or two higher, approaching towards an S. In many cases, however, disease of the semilunar valves is combined with disease of the lining membrane of the aorta, and the abnormal murmur heard may have its source partly in the one, and partly in the other. This murmur has also been mistaken for that occasioned by regurgitation through the mitral orifice, which accompanies likewise the ventricular systole and the first sound of the heart; the latter, however, is loudest towards the apex of the heart, is audible below it, and can often be heard near the angle of the scapula behind, where the obstructive murmur of the aortic orifice is quite inaudible; besides, the character of the two sounds are different, as we shall see when we come to describe the physical signs of disease at the mitral orifice.

Regurgitant disease. The result of disease at the aortic orifice being more frequently to prevent the semilunar valves from closing the orifice perfectly, than to occasion an impediment to the passage of the blood out of the ventricle, the physical signs of regurgitation are more frequently present at this orifice than those of obstruction.

When the semilunar valves of the aorta permit regurgitation, the diastole of the ventricles and the second sound of the heart are accompanied or replaced by a murmur which has usually more or less of a blowing character, and may be either a short, whiffing, or hissing sound, or a soft and prolonged bruit de soufflet, which, in a few cases, passes into a musical murmur. This abnormal sound is loudest upon the sternum, a little below the junction of the third rib with this bone, which is about the site of the semilunar valves; it is heard also both above and below this point for a short distance, but is hardly audible at the apex of the heart.

The only valvular murmur with which it could be confounded is that caused by obstruction at the mitral orifice, which occurs also during the ventricular diastole, but a murmur from the latter cause is rare, for the reasons presently to be mentioned.

MITRAL ORIFICE.

Obstructive disease. Obstructive disease at the mitral or left auriculo-ventricular orifice, though a frequent lesion, is not generally accompanied by a murmur of any intensity; and if the contraction is considerable, a murmur is altogether absent. This, no doubt (as Dr. Hope has explained), is owing to the force with which the blood passes from the auricle into the ventricle, being so trifling as hardly to be capable of generating a morbid sound, because the auricles possess little contractile power, and are almost constantly full, and the ventricle is not completely emptied during its systole. A murmur from this cause will accompany the ventricular diastole and the second sound of the heart, and its character must, for the reasons we have stated, be always soft and blowing.

Regurgitant disease. By far the most common valvular lesion met with is a state of the mitral valve or orifice permitting regurgitation; and the most frequent sound heard in such cases is bruit de soufflet, which is often loud, prolonged, and intensely blowing. It accompanies the ventricular systole, and obscures or altogether replaces the normal first sound of the heart. This murmur is often accompanied by purring tremor, if the orifice through which the regurgitation takes place is large, and the heart's action is at the same time strong; occasionally, too, it passes into a musical murmur.

The murmur of mitral regurgitation is louder about the apex of the heart than opposite the left auriculo-ventricular orifice, and there is a very good anatomical reason why this should be so. The carneæ columnæ of the mitral valve are attached near the apex of the heart and to the posterior wall of the ventricle; hence, a murmur produced at the left auriculo-ventricular orifice will be conveyed by them to the apex of the heart. Now, this part of the organ being in close contact with the parietes of the chest, the murmur will be better heard here than immediately over the orifice at which it is produced, because this orifice is deeply-seated, and a portion of the lung is interposed between the heart and the parietes of the chest in this situation, pulmonary tissue being a bad conductor of sound. For the reason stated above, this murmur is often audible also behind, near the inferior angle of the scapula. When the heart is much enlarged, and this murmur is at the same time very intense, it will generally be heard over a large surface in the precordial region.

The murmur of mitral regurgitation may be distinguished from that which is produced by obstruction at the aortic orifice (which occurs during the same period of the heart's action,) by its character, which is usually blowing and prolonged, whereas the other is often harsh and rough; by being louder near the left nipple than at the base of the heart, and diminishing gradually in intensity above this point; by being often audible posteriorly about the angle of the left scapula, where an aortic murmur would be inaudible; and by being often accompanied by purring tremor, which is very rare in the former case.

Pulmonic orifice. Disease limited to the semilunar valves of the pulmonary artery, or to the pulmonic orifice, is exceedingly rare; when it does occur, it is almost always accompanied by disease at the left side of the heart, the signs of which greatly predominate over those at the right side. Hence any abnormal sound is very uncommon at this orifice; and if it should occur, it is usually masked by the louder aortic murmur.

Tricuspid orifice. Contraction of the right auriculo-ventricular orifice is scarcely ever seen, but a state of this valve permitting regurgitation is not at all uncommon, though it does not give rise to a bruit which could be mistaken for that which accompanies regurgitation through the mitral orifice. Indeed, this lesion is generally accompanied by a dilated state of the right auricle and ventricle, and the force with which the blood is repelled backwards into the auricle is not sufficient to generate a morbid sound of any intensity. But this lesion is in general accompanied by a sign presently to be noticed—viz., distension and pulsation in some of the large veins of the neck.

From the precision with which the physical signs of disease at each particular valve or orifice have been laid down, it might be supposed that nothing is more easy in any case than to determine the valve which is diseased, and to detect the nature of the lesion. In practice, however, this

occasionally comes to be a difficult matter; not because these signs are not in most cases diagnostic, but because disease of one tissue of the heart is generally combined with morbid alteration of some other tissue of this organ, and because the advanced stage of valvular disease is generally accompanied by more or less impediment to the circulation through the cavities of the heart.

For instance, the physical signs of obstruction at the aortic orifice are often combined with those of regurgitation through it, as it is evident that the same amount of disease which deforms or occasions contraction of the orifice may render the valves incapable of closing it perfectly; the same may happen, and obviously for the same reason, at the left auriculo-ventricular orifice. Again, contraction at the aortic orifice may accompany regurgitation through the mitral orifice, or *vice versa;* or both orifices may be contracted, and both sets of valves at the same time permit regurgitation. The diagnosis in these complicated cases is necessarily much more difficult than where any single valve or orifice is engaged; it may, however, generally be made by attention to the rules already mentioned.

Not unfrequently, however, a further difficulty arises, in consequence of both sounds of the heart being altered or replaced by morbid sounds, and it appears impossible to distinguish the first from the second sound of the heart. This difficulty may sometimes be overcome by keeping the finger upon the radial or carotid artery while the stethoscope is applied to the precordial region; but, better still, by listening to the sounds of the right side of the heart upon the sternum, and to the right of this bone, where we can generally distinguish the two sounds; and then by tracing them from these points to the left side, we shall in most cases be enabled to distinguish the one from the other.

It is, however, a mistake to suppose that every variety of valvular disease is to be detected by the stethoscope alone; and, perhaps from its advocates insisting too much upon the auscultatory signs, this method of diagnosis has been brought into discredit with some. The fact is, that a trifling derangement of the valves at the left side of the heart, or a small amount of disease in them, is sometimes more readily diagnosed than a very advanced form of the same disease; and one of the worst cases of valvular disease may be accompanied by no abnormal sound whatsoever. For instance, if the mitral orifice is greatly contracted, and the venous system at the same time greatly congested, little blood can pass either directly from the auricle into the ventricle, or backwards into the auricle, owing partly to the minute chink left for its passage, and partly to the constantly distended state of the cavities. Here no bruit of any kind will be audible on auscultation, and we must be guided by other signs in arriving at a diagnosis.

On the Pulse in Valvular Disease. On this point Dr. Bellingham observes:—

The pulse affords no assistance to the diagnosis of valvular disease at the right side of the heart, and in several forms of disease of the valves at the left side, much less than might, *à priori*, have been expected. This is owing, in a great measure, to disease of one valve or orifice being often accompanied by disease in some other part of the heart, each impresses its own peculiar character upon the pulse, and thus leads to confusion. There are, however, a few cases in which the pulse presents well-marked characters, and in one form of valvular lesion it has been regarded as almost pathognomonic.

Aortic regurgitation. In disease of the aortic valves or orifice per-

mitting regurgitation, the pulse is regular, but jerking and receding, and the pulsation of the arteries of the upper extremities and head is visible. This jerking character of the pulse in aortic regurgitation is very characteristic, and once felt can never be mistaken; in well-marked cases it appears as if the blood consisted of separate little masses which passed in succession under the finger applied to the artery. M. Simonnet has given the name "*frôttement globulaire*" to this variety of the pulse, though he is mistaken respecting its cause; Dr. Hope compares it to a hard ball shot with force under the finger, the artery feeling empty; and Dr. Watson to the blow of a hammer without any prolonged swell of the artery; the sensation communicated to the finger being as if successive balls of blood were suddenly shot along under the finger. In a patient by whom Dr. Watson was consulted, the shock of the artery was plainly to be felt through his clothes, by the hand laid lightly upon the bend of the arm. "His wife told Dr. Watson that for five years this jarring blow had made it uncomfortable for her to take his arm when walking together."

The explanation of the jerking pulse of aortic regurgitation is apparently simple; in the normal condition the arteries are always full; consequently, though the amount of blood transmitted at each systole of the left ventricle is small, this displaces a column of blood of equal size, and therefore is capable of communicating an impulse to the blood in the arteries at a distance, which occasions the pulse. If, however, the semilunar valves of the aorta permit much of the blood, transmitted during the systole of the left ventricle, to regurgitate during its diastole, a backward motion, immediately following the other, is communicated to the blood throughout the larger vessels; the arteries thus become comparatively unfilled, lose their normal state of tension, and the column of blood in them appears to be interrupted. This sign will be always best marked in cases where the cavity of the left ventricle is at the same time dilated, and its walls are hypertrophied. For the same reasons, the pulse at the radial artery follows the ventricular systole by an interval longer than is usual in this valvular lesion, as first noticed by Dr. Henderson.

In addition to the pulse being jerking and receding in regurgitation through the aortic valves, the pulsation of the arteries is visible and locomotive; this is most evident in the superficial arteries of the head, face, and upper extremities; in which, Dr. Williams observes, "the arteries sometimes appear like worms under the skin, wriggling into tortuous lines at each pulse." This condition is generally most remarkable in the temporal and radial arteries and their branches. The visible pulsation in the arteries was first pointed out by Dr. Corrigan as a sign of aortic regurgitation; he observes that it is best seen when the arm is held with the hand above the head.

The peculiar jerking pulse observed in cases of aortic regurgitation, though very characteristic of this valvular lesion, is not peculiar to it, but may occur in some other diseased conditions; it cannot therefore be considered as pathognomonic, as it has been by many writers. For instance, in true aneurism of the left ventricle of the heart, in aneurism of the ascending portion of the arch of the aorta, and in cases of considerable dilatation of the arch of this vessel, the pulse may have this character. In the two former, a portion of the contents of the ventricle will pass during its systole into an abnormal sac instead of into the general arterial system, and hence the arteries of the neck and upper extremities will be in an unfilled condition; in the latter, the capacity of the dilated aorta, much exceeding that

of the left ventricle, and the coats of the dilated vessel being rigid and inelastic, as soon as the ventricular systole ceases, the blood from the upper extremities and head will regurgitate into the dilated aorta. In all these cases, therefore, the arteries being imperfectly filled, the pulse may have a jerking character, which cannot be distinguished from that which occurs in regurgitation through the aortic orifice without an examination of other signs. But inasmuch as dilatation of the arch of the aorta is often combined with a state of the semilunar valves permitting regurgitation, and as aneurism of the arch is occasionally also combined with the same valvular lesion, the combination of these conditions may impress the peculiar jerking character upon the pulse in a still more remarkable degree.

Contraction of aortic orifice. In diseased conditions of the aortic valves, or orifice, occasioning contraction, narrowing, and deformity of the orifice, the pulse may be little altered, unless the amount of contraction is so considerable as materially to diminish the channel for the passage of the blood out of the ventricle, when it will become small and weak in proportion to the degree of obstruction. But in almost all such cases, the semilunar valves of the aorta will be incapable of completely closing the orifice, and the signs of regurgitation will generally preponderate over those of contraction. The pulse has not much value as a diagnostic sign in contraction of the aortic orifice, except in so far that unless in very extreme cases it is seldom intermittent or irregular; whereas, the small weak pulse of considerable contraction, or of free regurgitation through the mitral orifice, is frequently intermittent and irregular also.

Mitral regurgitation. When the mitral valve imperfectly fulfils its functions, and permits a portion of blood to regurgitate into the left auricle at each ventricular systole, the pulse may be either little altered, or it may present well-marked characters. For instance, if the aperture is small through which regurgitation occurs, the pulse will preserve its strength and firmness; but if the aperture is so large as to permit much of the contents of the ventricle to pass backwards, the pulse will become small and feeble, in proportion to the amount of the refluent current, and ultimately intermittent and irregular, when it will closely resemble the pulse of considerable contraction of the same orifice, next to be noticed.

Contraction of the mitral orifice. When the left auriculo-ventricular orifice is contracted, owing to disease of the mitral valve or orifice, the passage of the blood from the auricle into the ventricle must be more or less impeded, and the pulse will become small and weak, according to the degree of contraction and to the amount of impediment; and if this is very considerable, the pulse will, in addition, become intermittent and irregular. This form of valvular disease in general leads to hypertrophy and dilatation of the ventricle, and is often combined also with a state of the orifice permitting regurgitation. In such cases the contrast between the strength of the impulse of the heart and the pulse at the wrist is very remarkable; "the heart," as Mr. Adam observes, "often beating so violently as to shake the patient in his bed, while the arterial pulse is small, weak, and irregular." "I know not how," he adds, "to describe it otherwise than by saying, that it appears as if there were two pulses, one slow and deliberate for two or three beats, succeeded by three or four rapid and indistinct pulsations."

A small, weak, intermittent or irregular pulse is not, however, peculiar to these diseased conditions of the mitral valve or orifice: in softening of the muscular tissue of the heart, the pulse has these characters; it may also present them, in any form of cardiac disease, accompanied by considerable

embarrassment to the circulation; as, for instance, in pericarditis with copious liquid effusion, or in cases where a coagulum forms in the cavities of the heart; such cases are, however, in general, readily distinguished by other signs.

The principal source of fallacy in the pulse, as a guide to diagnosis in valvular disease, consists in obstructive disease of any valve being generally combined with a state of the same valve permitting regurgitation, or being not unfrequently combined with obstructive or regurgitant disease of another valve, or being further complicated with hypertrophy or dilatation of the ventricles, or with anemic conditions of the system.

ART. 20.—*Diagnosis between the Bruit de Soufflet of Endocarditis and the Friction Sound of Pericarditis.* [The following concise remarks will be found useful in reference to a branch of clinical study in which the inexperienced auscultator is apt to be at fault] :—

Bruit de soufflet.	*Friction sound.*
1. The bruit of endocarditis is soft and blowing.	1. This sound presents different shades of rubbing, grating, or creaking.
2. Is usually single and synchronous with the pulse and impulse.	2. Usually double; louder during the diastole than systole.
3. Is prolonged so as in some cases to obscure the natural first sound.	3. Short; seldom obscures the valvular sounds.
4. Murmur distant and deep seated.	4. Superficial and near.
5. Murmur not limited to the precordial region.	5. Sound limited to the precordial region.
6. Murmur persists in every stage of the disease, and in every posture of the patient.	6. Varies in intensity at intervals; is modified by posture; disappears more quickly under treatment.

ART. 21.—*On certain Cases of Functional Disorder of the Heart.* By Dr. CHRISTISON.

(*Edin. Monthly Journal*, Feb. 1845, p. 80.)

The cases alluded to are chiefly met with among young adults, and are commonly mistaken for instances of organic disease. The affection usually coincides with a slender habit of body, and gives rise to symptoms which may be summed up in the following terms :—

The pulsation of the heart is frequent and very violent, so that the agitation of the chest is visible at a distance from the patient. The pulsation is always felt most intensely when the patient is in bed, and particularly when he lies on his left side; the symptoms are aggravated by hard study.

[As Dr. C. observes there is nothing in this group of symptoms to distinguish the affection from the ordinary functional disturbance.] One peculiarity, however, is the constancy of the leading symptoms, violent pulsation; and another is the region where the pulsation presents itself. The apex of the heart may be felt pulsating not as usual under the left nipple, but directly under the costal cartilages, very near the sternum, and between the fourth and fifth ribs. This part distinguishes the affection at

once from hypertrophy of the heart; for in this disease the apex commonly pulsates much farther from the sternum, and lower down than the sixth rib.

In these cases percussion does not show any extended range of dullness, neither is there any abnormal bruit. The pathology is obscure; it appears, however, that all the symptoms may be accounted for on the supposition that the heart is somewhat displaced, so that its apex lies unusually close to the parietes of the chest.

[The treatment of this affection recommended by Dr. Christison is living in country air, with moderate exercise and farinaceous food.]

Art. 22.—*On the Diagnosis of Aneurisms of the Aorta.*

By M. Gendrin, Physician to La Pitié.

(*Revue Médicale*, Feb. 1845.)

The present memoir comprises the diagnosis of aneurism of each of the three anatomical divisions of the aorta. Aneurism of the *ascending* portion, when it becomes evident externally, appears in the form of an hemispherical circumscribed swelling, which pulsates isochronously with the heart. The skin is not altered in colour till the latter periods of the disease. The patient generally complains of pain in the tumour, which is increased during the systole of the heart, and which becomes oftentimes much increased by motion, and during the digestive process. The tumour is more or less painful to the touch, and pulsates strongly.

If the aneurism be so small as not to have arrived at the walls of the chest, it may be recognized still by its impulse, and by a dull sound on percussion, which indicates that the corresponding portion of lung is pushed on one side. Auscultation also reveals a double "*bruit de choc*," and a dry friction sound; a to and-fro sound, in fact, is sometimes interposed between the systolic and diastolic bruits. If the site of the aneurism, and the heart be simultaneously examined, it is easily perceived that the sound given out by the aneurism is different both in seat and quality from that of the heart. The diastolic sound of the aneurism does not coincide with the second sound of the heart, but precedes it.

When the aneurism of the origin and ascending portion of the artery consists in simple dilatation of the arterial tunics, it gives rise to certain peculiar signs. Auscultation at the right border of the sternum, and over the cartilages of the second and third ribs on the *right* side, reveals the existence of only one bruit, combined with an impulse, which is synchronous with, and in some cases difficult to distinguish from the systole of the ventricles.

The aneurismal bruit, however, is heard almost as distinctly behind as before—while the heart's action is nearly inaudible in the back; moreover, the bruit depending upon the heart is heard on the left side, between the scapula and spine—the aneurismal bruit on the right. This difference in the sounds in the posterior aspect of the thorax is sufficiently diagnostic.

There is in some cases but little pain in simple dilatation of the ascending aorta; and in general it gives rise to no more than a sensation of uneasiness and fulness under the sternum. In this respect it differs widely from aneurism depending upon erosion of the arterial tunics.

If the ascending aorta becomes the seat of considerable dilatation, or be enlarged by aneurism from rupture of its coats, the trachea is usually pushed slightly to the left side. A difference in the pulse in the two wrists is generally considered to be a diagnostic sign of aneurism of the aorta;

this sign, however, is equally perceptible in simple arteritis, and therefore has no value as a diagnostic. Dyspnea is one of the signs of aneurism; but when the tumour is situated in the ascending portion, it is not constant but occurs only upon exertion or mental disturbance. If however the aneurism be sufficiently large to compress the principal divisions of the bronchi, the difficulty of breathing is continuous, and becomes suffocative when muscular exertion is made; and in such cases the compression is indicated by the existence of a sibilous râle. When the walls of the bronchi become inflamed in consequence of the pressure, expectoration of tenacious mucus is superadded, and should warn us of the near approach of one of the terminations of the disease, by rupture into the respiratory passages.

In some cases the compression is not limited to the bronchi, but is exercised also upon the origin of the pulmonary arteries, particularly those on the right side; the dyspnea is then greatly aggravated, and the patient usually is attacked with hæmoptysis. Lividity of the countenance is likewise present in these cases, on account of the deficient arterialization of the blood.

The dyspnea in cases of aneurism of the origin of the aorta, is often the result of a coincident affection of the heart or pericardium. Valvular disease and endocarditis form a serious complication, as they induce in general a greater or less amount of a ventricular hypertrophy. The proficient in auscultation will not confound the symptoms of these complications with those of the original lesion; but still the diagnosis often becomes sufficiently difficult to require attentive investigation.

It is a common opinion that the asthmatic paroxysm frequently depends upon disease of the heart and large vessels; it is not difficult, however, to distinguish real asthma from the dyspnea of cardiac disease. The former is truly paroxysmal, and oftentimes periodic, the intervals being in some cases of great duration. There is, moreover, constantly present a cough, with expectoration and sibilant râles. In general, emphysema may be recognized by the physical signs proper to that lesion. The diagnosis is further elucidated by the absence of the special signs of aneurism or morbus cordis.

Again, angina pectoris is frequently referred to simple or aneurismal inflammation of the organ of the aorta. This also is an error. The symptoms of the two affections are distinct; for instance, the substernal constriction, and the neuralgic pain extending down the left arm, which are the essential symptoms of angina, are not necessarily present in aneurism. Sudden death also is common in the former but not in the latter. [This will doubtless appear a bold assertion, but it is nevertheless the author's exact expression.]

Aneurism of the *arch* of the aorta is generally situated in the interval comprised between the origin of the arteria innominata and the left carotid and subclavian. The projection of the tumour shows itself in the space included between the internal third of the second right rib, and the corresponding portion on the left side. It is also sometimes perceived in the hollow between the insertion of the sterno mastoid-muscles. When the aneurismal tumour of this part of the artery becomes apparent to the eye, it gives rise to symptoms identical with those lately mentioned. The aspect of the tumour is the same, and the pain has the same character, with the exception that it is perceived at the summit of the sternum, and between the shoulders. If the tumour does not project externally, its diagnosis, is a matter of considerable difficulty, especially when the posterior portion of the arch is the part affected. The dullness on percussion in deep-seated aneurisms of the arch is somewhat obscure, and is therefore of little service as a diagnostic

sign. The auscultatory phenomena are similar to those exhibited in aneurism of the ascending aorta, but are perceived in a different situation. In front they are heard at the summit of the sternum, and under the junction of the clavicle and first rib with that bone; behind, they are most evident on a level with the second rib, and close to the spinal column.

The deviation of the trachea is more decisive in aneurisms of the arch than in those of the ascending portion, but the apex of the heart is not displaced, as is occasionally the case in the latter. The pulse is deceptive as a diagnostic symptom taken per se, but is a valuable accessory sign, and is one by which we may judge of the exact site of the disease. If, as is commonly the case, the innominata is implicated in the aneurismal tumour, the pulse is feeble in the right wrist. When, on the other hand, the left pulse is the feebler of the two, we may conceive that the disease is located at the left extreme of the arch.

The dyspnea in aneurism of the arch, is subject to the same conditions as when the ascending aorta is the seat of the disease. It does not differ from the dyspnea, which occurs in the latter case, unless the trachea be compressed. In that case, inspiration is remarkably difficult, and is accompanied by a whistling sound. In some cases the voice is enfeebled, or even entirely extinguished.

Of all forms of aortic aneurism, those affecting the *descending* part of the vessel are the most difficult to recognise. It is difficult to distinguish the impulse and the bruit, when perceived in front from those of the heart itself, but we may sometimes arrive at a diagnosis by compressing the abdominal aorta. This causes the second sound to cease, if it originates in the artery, but has no influence upon the cardiac bruits. If, however, to the double '*bruit de choc*,' perceived in the front of the chest, is added a sibilant râle, and if the second sound slightly precedes the diastole of the heart, the existence of an aneurism may be considered certain.

The signs of aneurism of the descending aorta are perceived more plainly in the back than in the front of the chest. They are, as perceived in this situation, the double 'bruit de choc,' together with a rough or sibilant friction sound. If these signs are very evident, no doubt need be entertained of the existence of aneurism, especially if they are conjoined to a tearing, gnawing pain along the spinal column, which is aggravated by motion of the upper extremities.

SECT. V.—DISEASES OF THE CHYLOPOIETIC SYSTEM.

ART. 23.—*On Hepatalgia.* By R. H. ALLNATT, M.D., F.S.A.

(*Medical Gazette*, March 1845, p. 798.)

[After premising that the subject of hepatalgia has been overlooked by the majority of systematic writers on medicine, or confounded by them with acute or subacute inflammatory action of the liver, the author thus proceeds to describe the affection]:—

Although the pains accompanying hepatalgia may be as intense as those of hepatitis, and in some instances, perhaps, more urgent, they are not constant, but are, throughout. of a paroxysmal character, affording in the nterval a complete immunity from pain. The pathognomonic symptoms ndicative of inflammatory action of the liver, are pyrexia, tumefaction,

great tenderness in the hypochondrium, frequent strong pulse, furred tongue, vomiting sometimes of a bilious, and at others of a dark coloured secretion, accordingly as the substance of the liver is more or less implicated. The bowels are irregular, the evacuations variable in appearance; and the urine scanty and high coloured. In hepatalgia, on the contrary, these signs are invariably wanting; there may exist, indeed, constant pain and tenderness over the region of the liver, increased to a certain degree by pressure; but manifest exacerbations even in the worst case occur, which sufficiently indicate its paroxysmal character. The functions of the organ may proceed uninterruptedly as in the condition of health. The tongue may be clean, or only slightly furred in the centre, and the urine as in many other nervous disorders is increased in quantity, and of a lighter colour than ordinary.

The treatment of hepatalgia is very simple, and merely requires the combinations which are found to be useful in other cases of neuralgia. Mercury, as in tic douloureux, heightens the affection, increases the general irritability, and renders the system universally more obnoxious to incursions of morbid nervous sensibility. Carbonate of iron is also injurious. Gentle purgatives, combined with colchicum, ipecacuanha, and hyoscyamus, will seldom fail to work a speedy cure, and if the constitution have suffered from the protracted pain, alkaline vegetable tonics will effect what we shall in vain expect from mineral preparations.

Art. 24.—*On Cirrhosis of the Liver.* By D. J. Corrigan, M.D., Physician to the Hardwick Hospital, &c., Dublin.

(*Medical Times*, Jan. 1845.)

[The disease to which the term cirrhosis of the liver has of late years been applied, consists in a subacute or chronic inflammatory affection of the cellular tissue which forms Glisson's capsule, and which, as is well known, is intimately distributed through the organ, giving an investment to each acinus, and affording a bed for the ramifications of the blood and other vessels peculiar to the hepatic system. The consequence of this inflammation, as in the cellular structure of other parts of the body, is contraction, by which the glandular structure is irregularly displaced and compressed accordingly as this contraction varies in extent, and the blood-vessels and biliary ducts are more or less obstructed. When this pathological condition exists in a high degree, it constitutes the granular or hobnail liver. The secondary effects of the lesion are of a very severe character, and are those which might be expected from the obstruction which exists to the course of the portal blood on the one hand, and of the biliary secretion on the other. They are jaundice and dropsy of the peritoneal cavity, with all the varied symptoms which arise from imperfect digestion and assimilation. This condition of the liver when once established, is as far as we know incurable, and as its initiatory symptoms are little understood, it too often gains a footing before any effectual means are taken to arrest its progress. For this reason we consider that the following remarks of an eminently practical physician, are worthy of special remembrance]:—

Symptoms of first stage of cirrhosis. A man comes to consult you, who has been ailing with, what himself and friends term, cholic pains—these are generally felt at, or about, four or six hours after dinner; so it is nothing unusual, if he has dined about five P.M., for him to be awoke from sleep by an attack of these pains. They are accompanied in general by

quick pulse, from eighty-six to ninety, vomiting, constipation, and some slight degree of fever; under the use of some stimulant, taken internally, joined to the administration of a laxative clyster, this attack is removed; sometimes the patient attributes this train of symptoms to errors in diet, but after some short time they come on, when nothing of an injurious nature has been taken. According as the disease advances, you have these "cholic" fits more frequent, the vomiting is more intense, the pulse is quicker—this may or may not be so, it is immaterial; the skin is dry, the tongue is red, and smooth in the centre, presenting an appearance as if the papillæ had been removed from thence; in most cases there is pain felt at the top of the right shoulder, and in all a degree of jaundice, very slight indeed, is visible, which, however, is much better marked if you examine the conjunctiva, having previously turned out the lower lid. The jaundice in this disease comes on gradually. With regard to the pain at the top of the right shoulder, which, as you know, has been set down by the older writers, as a sign of hepatic disease, I must confess myself completely ignorant as to its cause. As to the value which is to be attached to it, numerous examples of this disease in which it has been present, lead me to look upon it as a very important item to be taken into account in coming to a diagnosis. In this stage of the disorder, along with the symptoms just enumerated, there is some slight pain present in the region of the liver and duodenum. But the most attentive and careful examination cannot detect the slightest alteration in the liver itself. The stools at this period, along with the usual feculent matter, are loaded with a quantity of mucus; and are sometimes streaked with blood. Here we must stop for a few moments to ask ourselves, what do the above-mentioned symptoms denote? We have pain simulating that of cholic, accompanied with tenderness of the right side; vomiting; tongue smooth and red, seeming as if its central papillæ had been removed; quickened pulse at ninety-six; dry skin; pain at top of the right shoulder; and, lastly, passage of fæces, loaded with mucus and tinged with blood. Do they denote any intestinal affection? Not dysentery. For though we have mucous stools, streaked with blood, yet we have no tenesmus. The colon is not engaged; were it so, we should have diarrhœa. We must, therefore, proceed higher up the intestinal tube to search for the *locale* of the disease. This, I am inclined to believe, is the duodenum. This opinion I have been led to form from a careful consideration and comparison of the above symptoms, which, as I think, are nothing more than the signs of gastro-duodenitis, or duodenitis itself. And physiology explains to us how duodenitis may cause disease of the liver; it teaches us that diseases of membranous structures, adjoining which, are glands that open on the above tissues by means of ducts, of similar texture as the membranes in question, are liable to extend their action to the glands which open on such diseased membranes, or the glands may become sympathetically affected. We see this exemplified in affections of the mucous membrane of the intestines, which frequently involve the glands of the mesentery in the existing mischief. This disease of cirrhosis I would look upon merely as the consequence of duodenitis, and we shall presently find another argument in favour of the opinion as to the gastric origin of the disease in question, in the fact, that the medicines we find most serviceable in removing certain functional diseases of the digestive organs, are these, which in the first stage of cirrhosis, have also been found most productive of benefit to our patients.

Treatment. The most essential preliminary to the successful medical

management of your patient is an injunction on him to refrain sacredly from every description of stimulant, such as ale, porter, wine, &c. Such a prohibition will be the more necessary, because from the habit of taking stimulants of the above class during the pain, which most probably has been indulged in, and which might have been erroneously deemed capable of relieving the pain, your patient might fancy himself benefited by them, or at least, that they were not productive of injury to him.

Such an idea would be a most fatal one to act upon: because any trifling remission of pain produced (if at all) by their use, would be sure to be followed by an increased intensity of all the previous evils. All errors and excesses in diet must be religiously spoken against also; and the same veto must be placed upon any articles of food which the patient might previously have found prejudicial, though tempting. While you restrain him thus, you will take care that his diet is one of a sufficiently nutritious character, comprising, as it may, a light farinaceous milk diet, with a proportion of animal food, suitable, both in quantity and quality, to the enfeebled energies of the stomach and digestive apparatus. At the same time that you lay down these rules for his guidance, acquaint him fully with the peculiar and precarious situation in which he is placed,—a situation from the inevitable fatality of which, he cannot have the slightest chance of escaping, unless he implicity adhere to your *dicta*. Another, and a most particular object for you to enforce all through, is the necessity which exists of your patient breathing as pure an air as possible. With men of business, who consult you at the commencement, such a thing could not be practicable, implying, as it does, an entire abandonment of business. Where circumstances forbid this, you must see that your patient's nights, *at least*, are spent in the country; without this precaution, all your remedial efforts will be unavailing. Indeed, it is astonishing to witness the wonderfully-restorative effects which a residence in the country produces in persons labouring under this disease. Before a month has rolled over in the country, the rheumatism, as the pain at the shoulder is called, will have completely disappeared from persons who had been doctoring themselves unavailingly, in town, with plasters, liniments, &c. for three, four, or six months previously: the pulse becomes slower, the tongue moist, the appetite becomes much improved: in fine they quickly become all but restored to their former health, under the conjoint good effects of pure country air and appropriate medicines. As regards the treatment "paroxysmo instante," I shall not detain you by entering minutely into its details. It will suffice me to mention that counter-irritation by spirit of turpentine (in the manner previously directed under the head of bronchitis) over the seat of pain, the exhibition of one or two grains of powdered opium, with calcined magnesia, in a draught, will invariably, in every case, be quite effectual in removing it. In such cases be not misled by the patient's statement of his having derived relief from stimulants on former occasions. Do not have recourse to them, though they may have been sanctioned by prior medical advice.

Now, with regard to the radical treatment. Your first step should be the application of 10 or 12 leeches on, or the abstraction, by cupping, of ℥viij or ℥x of blood from, the usual seat of pain. The cupping over the liver and duodenum may be repeated once a week for three, four, six, eight, or nine times, as the severity of the case may seem to demand. *Here*, it would not be advisable for you to take away blood in any large quantity, as the persons in whom the disease generally appears, are not those who would bear with impunity such large evacuations, being for the most part,

persons of constitution naturally weak and delicate. After the topical bleeding, counter-irritation should be directed to be sedulously employed over the surfaces covering the inflamed organs, and for this purpose I do not know of anything better than the unguent. antim. tart.; the use of which may alternate with the bleeding. Along with these topical means, you will have to employ constitutional ones, those which are generally selected to subdue inflammation. Direct for this purpose, the administration of mercury, combined with opium. Of this mineral, I invariably select the simplest preparations, such as iodidum hydrarg., or the hydrarg c. creta. The administration of this mineral will require to be continued until its effects are produced, namely, gentle ptyalism. This must be kept up for a period of a fortnight or three weeks. Severe salivation, I reckon to be uncalled for here, and likely to be productive of injury rather than benefit, for the same reasons which I have urged against large bleedings, namely, its tendency to increase existing debility. After the mercury has done its work, you will very advantageously *now* prescribe the use of sesquinitrate of bismuth, a medicine, which, (although I do not think it possessed of peculiar or specific effect on the liver), in the present disease is eminently serviceable. The combination which I am in the habit of prescribing for this purpose consists as follows :—

℞ Ferri cum saccharo
Sodæ bicarbonat. aa gr. x.
Subnitrat bismuthi. gr. v.

Fiat pulvis : to be taken three times a day.

This I direct to be persevered in for some length of time, till all the symptoms of pain are removed. This may take up a period of two or three months, but in general you will find it much harder to dissuade your patient from taking, (such an effect has it in relieving him) than you would have in persuading him to continue it. If the symptoms of this disease should again recur at any period subsequent to the discontinuance of the above combination, it will be very easy for you to have recourse to it again.

ART. 25.—*On a Dangerous Form of Jaundice.* [Dr. CORRIGAN thus describes a form of jaundice of not unfrequent occurrence, and which, if not judiciously treated in the first instance, is apt to prove fatal by coma and other symptoms depending upon the non-elimination of the bilious secretion] :—

" This form of jaundice is to be met with, generally, among the poorer classes of society, but it occurs, with too great frequency among persons of the middle rank of life, who have, for the most part, led sedentary lives. We find it occurring in merchants, whose lives have been made uneasy by having met reverses in trade, or by engaging in unsuccessful speculations. We find it occurring in females, mourning over the loss of a husband or a parent, while we as frequently meet with it in persons whose histories present nothing tangible to account for the disease. It sets in suddenly; sometimes we find the patient jaundiced all over in 30 hours, and this state of discoloration may continue for three days, three weeks, or as many months as weeks. In this form of jaundice, the pulse is regular, the tongue clean, the skin cool, and the appetite, in general, is tolerably fair; and we very often find, throughout the disease, the patient lively and cheerful, and able to perform the duties of life as well as ever. The only evidence of deranged health being, the jaundiced countenance, the white stools, and the urine loaded with bile. During this state of little, or no derangement, from the

natural standard of health, if the slightest tendency to head affection, such as delirium or coma, should set in, no effort of your art can save the patient. All is at an end; for the records of medicine do not present a single case of recovery from the situation which I have just now described. I know that, in works on practice of medicine, you find this disease either not noticed at all, or if it is, merely as one of no importance. The most minute *post mortem* investigations discover nothing whatever faulty, either in the brain, liver, gall-bladder, stomach, or intestines. With regard to its pathology, we are completely in the dark, but though I cannot give you any information on this head, yet as a set-off to this want of pathological knowledge on my side, I think that I can give you what you will prefer to this, namely, an unerring cure for the affection in question, whenever it shall present itself to you in your future practice.

Having seen many cases of this disease unavailingly treated in town by blisters and leeches to the side, by the exhibition of purgatives, alkalies, and mercurials; knowing many such cases which were deemed incurable here, that afterwards were cured by country quacks by means of nauseous medicines; struck with this fact, and reasoning from the effects on the stomach of the quack medicines which had been given for its cure, I determined to try the effect of emetics in it. The event was completely successful, and I can assure you, that in an ample experience of four or five years since I first adopted this line of treatment, I have not had a single failure. In general, I am not wont to speak sanguinely of any remedies but those on which I can place implicit reliance, and the present occasion gives me an opportunity of speaking most favorably of the medicine which I have just been recommending to you. For the cure of this disease, it will be quite unnecessary for you to prescribe mercury, or any other medicine, save an emetic of ʒss. ipecacuanha every second night until the jaundice disappears. This frequently occurs after the action of the second emetic; even it will not be necessary for you to have recourse to purgatives, as the ipecacuanha in most instances relaxes the bowels; but, if you do order purgatives, let them be of such a sort as will not colour the fæces—so that you may perceive if the bile is again being propelled into the intestines. Of the medicines not liable to this objection, the best you can select are decoctum aloës compositum, and magnesia usta. By carrying into operation in your future practice, the routine which I have just sketched out for you, I am confident you will be able to add to mine, your unqualified approbation of the benefit derivable from the use of emetics in this form of jaundice.

Medical Times, Jan. 25, 1845.

Art. 26.—*On the Treatment of a peculiar Form of Diarrhœa.* The same physician has called attention to a form of diarrhœa, of frequent occurrence in the upper classes of society. He observes that:—"The persons most subject to this affection are females, of what is termed the leuco-phlegmatic temperament, characterized by weak, flabby, muscular development, and general indolence of constitution. In such persons, the menses may be either profuse, or sparing, in quantity; or they may be regular; but this is of no consequence. Connected with this bowel complaint, you will always find more or less of leucorrhœa, which, on inquiry, you will find to have preceded the diarrhœa: as though it would seem that the mucous membrane of the intestines becomes affected just in the same manner as the epithelium of the vagina; these persons are also affected

with "bruit de soufflet" of the heart, which is always audible to themselves, and causes them great anxiety. You will find them also, labouring under catarrh, with copious secretion, accompanied by pain of a neuralgic character, here to-day and there to-morrow;—they get drooping and depressed in spirits;—lose all inclination for mixing in their usual society; and then their friends, fearing the occurrence of phthisis, become alarmed at their delicate state of health, and, in great consternation, look for advice. This train of symptoms would appear to be caused by the baneful effects of living much in fashionable life, and by stopping up late of nights in crowded rooms, to enjoy their pleasures. These evils, joined to the already existing one of a constitution habitually delicate, are quite enough to produce the disease in question. For the cure of this I have seen the Pharmacopœia unceasingly ransacked; I have seen the most powerful astringents tried, separately, and in combination with other remedies of the same character; still no good was done by them, while afterward the disease has yielded, and that quickly, under the exhibition of decoctum hæmatoxyli, as recommended by Dr. Abercrombie, in doses of a wine-glassful, three times a day. I had, not long since, a lady under my care labouring with this distressing affection, in whom it was quickly subdued by this simple remedy.

Art. 27.—*Semeiotic Value of Abdominal Pulsation*,

By J. Nottingham, m.d.

(*Medical Times*, Feb. 22, 1845.)

[Abdominal pulsation, is a frequent symptom, in many affections of very different characters; and is also one to which the patient's mind is uneasily directed. It may arise, according to Dr. Nottingham, under the following different circumstances]:—

Aneurisms of the aorta may give rise to it, in which case its intensity is influenced by the position, size, and state of progress of the aneurismal tumour; the facility with which it is detected depending upon the flaccidity of the abdominal parietes, and the absence of omental fat.

Enlarged pancreas sometimes originates epigastric pulsation, the pulsations of the subjacent aorta being rendered preternaturally distinct; of this Dr. Nottingham met with an instance in a female who died of pulmonary consumption. She was supposed to labour under aortic aneurism, as there was strong pulsation above the navel, with bruit de soufflet, and powerful impulse which raised the hand of the observer. The patient died, and the body was examined. The aorta was healthy, but the pancreas was not so, being enlarged and firmer than natural; hence the difficulty of the diagnosis, the bruit de soufflet being here associated with a narrowness of the arterial tube by the pressure of the tumour.

In some cases, where the transverse colon is loaded with excrementitious accumulation, patients will complain of a "beating in the inside," and allude to it as one of the most remarkable symptoms of their malady. By attending to the state of the alimentary canal, the source of the beating will easily be detected.

Abdominal pulsation is also occasionally felt in carcinoma of the stomach; it may occur in mesenteric disease, in enlargement of the lumbar glands, or in any other tumour.

After pericarditis, when from adhesion the heart is more or less fixed to the diaphragm, its action is sometimes accompanied by a movement of

alternate retraction and relaxation observed on the exterior of the epigastrium. This symptom is rendered still more evident if it coexists with hypertrophy of the left ventricle, and contraction of the cardiac orifices.

There are also states of the system in which the mass of circulating blood is suddenly lessened, the nervous irritability being at the same time augmented. In these states, abdominal pulsation is not an unfrequent symptom, and we meet with it therefore after great hemorrhages, as in parturition.

In certain other cases, the beating of the abdominal aorta is rendered unnaturally perceptible to the patient and physician, by the presence of flatus in the intestines.

SECT. VI. DISEASES OF THE GENITO-URINARY SYSTEM.

ART. 28.—*On the Pathology, &c. of the Urinary Deposits.* By Dr. GOLDING BIRD.*

[Although the important researches of Dr. Golding Bird are now somewhat destitute of novelty, having been some time since embodied in the pages of the Medical Gazette, yet we think that we shall be conferring a benefit upon our readers by reproducing the more important portions of them in a condensed form, especially as the publication of a separate and most valuable work on "Urinary Deposits" comes within the limits of our retrospective labours. We feel convinced that the brief summary which we shall give cannot fail to produce the desire for a perusal of the original work]:—

The principal pathological conditions of the urine which are commonly met with are the presence of uric acid and the urate of ammonia, the oxalate of lime, of the phosphates, and of certain elements of the blood.

URIC ACID.

Diagnosis of uric acid deposits. Uric acid does not dissolve by heat, but on the contrary is rendered more distinct by the solution of the urate of ammonia which frequently accompanies it. Hence, in examining for this deposit, heat the urine in a watch-glass; the uric acid becomes visible as the urate of ammonia dissolves. Heated with liquor potassæ, the uric acid dissolves. With nitric acid it is also dissolved; leaving, on evaporation, a residue of a beautiful pink, which becomes purple when held over the vapour of ammonia.

Microscopic characters. The original form of the uric acid crystal is the rhombic prism. In order to observe these crystals, allow the urine to repose in a tall vessel, decant the greater portion, and place some of the turbid layer into a watch-glass and warm it gently; remove the supernatant liquor by a pipette, and replace it with distilled water; the crystals then become distinct. "All that is then required, is to place on the stage of the microscope and under the watch-glass, a piece of black velvet; by means of a condensing lens, let a strong light be thrown upon the crystals; then bring the object glass into proper adjustment, and the colour, as well as figure of the crystals, will become beautifully defined on the black ground."

The rhombic form is, however, frequently replaced by others, especially by the square. Sometimes the crystals approach the figure of a fleur-de-lys, at

* Condensed from "Urinary Deposits; their diagnosis, pathology, and therapeutical indications." 8vo. 1844.

others, they appear as flat tables, curiously marked with longitudinal striæ, giving the appearance of a fimbriated edge. The coarse sand, which is of a red or deep orange colour, is generally composed of cohering, thick, rhomboidal prisms, forming, indeed, minute calculi.

Diagnosis of Urate of Ammonia. These deposits vary in colour from absolute whiteness to a pale fawn colour, brick red, pink, or purple. The deposit does not appear until the urine has cooled, and disappears on the application of heat. If urine containing this deposit be placed between two glasses and examined with the microscope, it is found to be composed of myriads of minute globules, forming linear masses, or delicate stellate figures.

Circumstances giving rise to the uric acid and its compounds. "Excluding all abstract theories, whenever an excess of uric acid, or its combinations, occur in the urine, a normal quantity of water being present, it may safely be inferred that one or other of the following states exists.

A. Waste of tissues more rapid than the supply	Fever, inflammation, rheumatism, phthisis.
B. Supply of nitrogen in the food greater than is required for the reparation of tissues	Excessive indulgence in animal food, or too little exercise.
C. Supply of nitrogenized food not in excess, but digestive functions unable to assimilate it	All grades of dyspepsia.
D. The cutaneous outlet for nitrogenized excreta being obstructed, the kidney is called upon to compensate for this deficient function	All diseases attended with arrest of perspiration.
E. Congestion of the kidneys, produced by local causes	Blows, and strains of the loins, diseases of the genital apparatus.

[The *medical treatment* of this condition of the urine must be based upon the due discrimination of the exciting cause. If the first condition be the cause, the remedy obviously consists in the withdrawal of a portion of the animal food, or an increase in the amount of exercise. Under the other conditions of the system, the treatment resolves itself into the following indications]:—

1. *Attention to the function of the skin.* This is an indication of much consequence. Warm clothing, with repeated friction by means of a hair blove, removes the deposit of uric acid gravel. The warm bath, and still getter, the vapour bath, is also a most valuable diaphoretic. The latter is conveniently applied in private practice by means of Duval's apparatus. Actual diaphoresis is by no means absolutely necessary.

2. *Restoring the tone of the organs of digestion.* This part of the treatment of calculous affections must be modified by the peculiarities of the case, and is identical with that of the different forms of dyspepsia. Great relief may be obtained by careful attention to the bowels, and minute doses of mercury, as a grain of hyd. c. cretâ, with three grains of extract. conii, given three times a day, with moderate doses of the carbonate of potash in infus. serpentariæ. Gastrodynia and pyrosis may be met with half-grain doses of argente nitras, given immediately before a meal.

3. *Remedies which act as solvents.* These chiefly consist of alkalies and their carbonates; the biborate and phosphate of soda, and benzoic acid. The liquor potassæ may be employed in half drachm doses thrice a day.

The carbonates of potass and soda are, however, more agreeable forms, and of these the bicarbonate of potass is to be preferred. The latter may be usefully combined with citric acid, in the proportion of grs. v. to ʒss. of the bicarbonate, dissolved in a tumbler of luke-warm water. This mixture evolves enough carbonic acid to be "sparkling," and is taken with readiness.

It is to be remembered that some persons cannot bear the free use of alkalies without suffering severely in their general health. Dr. Prout affirms that their injudicious use may lead to the formation of oxalic acid.

Other solvents are the biborate and the phosphate of soda; the latter is specially recommended by Liebig; the dose should be ℈j to ʒss, largely diluted. Dr. Bird states that he has administered this drug in two or three chronic cases of uric acid gravel with great effect.

The benzoic acid has likewise been much praised of late, having been first introduced by Mr. Ure. It may be given in ten-grain doses, dissolved in a weak solution of phosphate of soda, as below.

℞ Sodæ carb. ʒj ss.
Acid. benzoici, ℈ij.
Sodæ phosphatis, ʒiij.
Aquæ ferventis, ℥iv.
Aquæ cinnamomi, ℥viiss.
Tinct. hyoscyami, ʒiv. M. ft.
Sumat. æger. coch. in magna ter in die.

It is important to bear in mind, that, by the employment of remedies capable of dissolving a deposit in the urine, we are merely palliating, and not curing the disease. Its entire removal can only be accomplished by remedying that state of the system, or of a particular organ, which may be the exciting cause of the calculous formation.

PURPURINE.

Urine containing this substance is of a pink or purple colour, and of variable specific gravity. The purpurine is deposited in conjunction with urate of ammonia, where that product is in excess, and gives to it a deep carmine colour. If the urine be evaporated to the consistence of an extract, and treated with alcohol, it yields a fine purple tincture. This property will at once distinguish the colouring matter from that of blood, for which it might otherwise be mistaken.

Pathological indications. The presence of purpurine in excess is almost invariably connected with some functional or organic mischief in the liver, spleen, or some other organ connected with the portal circulation. It is, therefore, in its lighter shades, a common occurrence in the dyspepsia of the intemperate. Pink deposits are almost constantly present in cirrhosed or contracted liver.

OXALATE OF LIME.

[Dr. Bird was the first to point out the frequent occurrence of this deposit; neither Prout, (until his last edition,) nor Rayer, nor Willis, have given to it the importance which it is now sufficiently clear that it demands. It is, according to the observations of Dr. Bird, of far more frequent occurrence in the densely populated cities than the deposits of earthy phosphates.]

Diagnosis and microscopic characters of oxalate of lime. To examine for this deposit, allow a portion of urine, passed soon after a meal, to rest in a glass vessel; decant the upper fluid six-sevenths; pour a portion of the remainder into a watch-glass, and warm it gently. This proceeding removes

any obscurity arising from the presence of urate of ammonia. Having then allowed the urine to repose for a few minutes, remove the greater portion of the fluid with a pipette, and replace it with distilled water. A white glistening powder will now become visible, which, under a low magnifying power, is found to consist of octohedral crystals of oxalate of lime. These crystals, ignited on platinum foil, give a residue of carbonate of lime. The octohedral is the ordinary shape of the crystals, but they sometimes assume other forms, the most usual of which is that of a dumb-bell.

A very constant phenomenon observed in the microscopic examination of oxalic urine, is the presence of epithelial scales. So constant, indeed, is this occurrence, that the presence of the latter has frequently led to the suspicion of the presence of oxalate of lime.

Pathological origin of oxalate of lime. This is a question of very great interest. It is scarcely possible to avoid being impressed with the probable physiological connexion between this matter and the presence of sugar. It is indisputable, that saccharine matter finds its way to the blood under certain circumstances, and is eliminated by the kidneys; and we know that, under certain morbid influences, the blood may, while in the stomach, be rapidly converted into sugar, and pass by the kidneys as an effete matter. Recollecting, also, the facility with which sugar and its chemical allies, as gum, starch, &c. are, under the influence of oxydizing agents, converted into oxalic acid, we are tempted, with Dr. Prout, to the conclusion that the oxalate of lime owes its origin to sugar.

[Dr. Bird, however, has observed in opposition to this opinion]: 1. That in the urine oxalate of lime is diffused through the fluid, and in a crystalline form. 2. That the urates are in excess in the majority of cases. 3. That in all there is more urea than in healthy urine of the same density. 4. That there is frequently an excess of the phosphates attending the oxalate of lime. 5. That no evidence of free sugar has occurred in the specimens submitted to examination. Now in diabetes there is seldom an excess of urea or the urates, the increased specific gravity depending solely on the presence of sugar. Thus so far as the abstract examination of the urine is concerned, no countenance is given to the idea of there being any relation between oxalic and saccharine urine. What then is the source of the oxalate of lime?—from the symptoms alone which accompany the deposit, there can be no doubt of the existence of serious functional derangement of the digestive organs, especially of the stomach, duodenum, and liver. Whatever, therefore, be the immediate agent which causes the kidneys to secrete oxalic acid, the primary cause must, as shown by Dr. Prout, be referred to the digestive apparatus. It must be recollected, also, that an excess of urea, and often of uric acid, in most instances accompanies oxalic urine; it is probable, therefore, that both these products are the result of the same morbid influence; and when the close chemical relation between urea, uric, and oxalic acid, is borne in mind, is it not a legitimate conclusion that the disease under consideration is a variety of azoturia, in which the vital chemistry of the kidney converts part of the urea, or the elements which in health would have formed urea, into oxalic acid?

Symptoms accompanying the secretion of oxalic acid:—As a general rule, persons affected with oxalic urine are remarkably depressed in spirits, and exhibit a peculiarly melancholy aspect. Dr. Prout mentions a lurid tinge on the skin. They are generally emaciated, hypochondriacal, and irritable in temper. The sexual power in men is deficient or absent. There is usually a constant pain or sense of weight in the loins, with great derange-

ment of the assimilative powers.—[To these may be added, according to Dr. Bence Jones, frequent desire to micturate; the urine in some cases being scanty, at others profuse in quantity.]

The most common exciting causes appear to be exposure of the lower part of the spine to cold, mechanical violence in the same region, and unnatural excitement of the sexual organs, as is shown by the frequent concomitant of involuntary seminal emissions. In many cases there was no obvious cause beyond mental anxiety and attention to business.

Therapeutical indications. The treatment in the majority of cases is very successful. As a general rule, all the functions of the body, when obviously imperfect, should be corrected; the skin should be protected by flannel; and the diet carefully regulated. This should consist of well-cooked digestible food, of vegetable and animal substances; all things which tend to produce flatulence being carefully avoided. Beer and wine should not be allowed, especially the former. If some stimulus be required, the best is weak brandy and water. The nitric acid, or the nitro muriatic acid in infus. gentianæ, if continued sufficiently long, will generally be found successful. In cases where these have failed, active tonics, especially the sulphate of zinc, or if the patient be anemic, the salts of iron, appear to be of great use, as is likewise the shower-bath. There is one remedy which appears to exercise a marked influence over the characters of the urine, and which holds out great promise of utility in oxyluria—this is colchicum. In two instances in which oxalate of lime existed in abundance before its employment, uric acid reappeared and replaced the oxalic acid in a few days.

EARTHY PHOSPHATES AND CARBONATE OF LIME.

Diagnosis. The earthy salts are always white unless coloured with blood; they are soluble in dilute hydrochloric acid, and insoluble in ammonia or liquor potassæ. Heat does not clarify the urine. The chief errors in diagnosis arise from the presence of mucus and pus in the urine, which mask the chemical character of the earthy deposit.

The physical appearance of these deposits is variable; where it consists chiefly of the triple phosphates it subsides as a white crystalline gravel, or if the quantity be small it appears on the surface of the urine in the form of an iridescent pellicle. At other times the phosphates will fall to the bottom like a dense cloud of mucus, or hang in ropy masses so similar to that product as not to be distinguished from it by the naked eye.

The urine which deposits these salts is not necessarily alkaline; it is pale, secreted in large quantities, and of low specific gravity (1·005—1·014). In the case in which the iridescent pellicle appears, there is usually present a form of irritative dyspepsia, but this is merely a functional and not an organic derangement, the urine being often of high specific gravity (1·020—1·030), and containing an excess of urea. At other times, the urine is deep brown, fœtid, generally alkaline, and loaded with ropy mucus, in which the crystals of the triple phosphate will be discovered.

Pathological indications. These deposits always denote a serious state of things, being generally indicative of severe functional, and oftentimes of organic mischief. They always co-exist with a depressed state of nervous energy, which is often general and more rarely local in its seat. Of the former we have instances in the wear and tear of body and mind in old people; of the latter in injury to the spine. The occurrence of the triple salt, unconnected with deposit of phosphate of lime, exhibits the least alarming

course of events. It is generally in these cases signalized by irritability of temper, restlessness, uncertain appetite, and fatigue on slight exertion.

In the milder cases of indigestion, especially in gouty habits, the phosphates appear in the form of the pellicle before mentioned. This condition of the system is disinclined to the formation of stone, but is rather to be regarded as an index of the state of the assimilative functions. A valuable diagnostic mark in these cases, in contra-distinction to those where organic mischief is to be apprehended, consists in the fact that in the slighter cases the phosphates appear only in the urine passed at night.

The triple salt likewise appears in the urine of very old people, especially if they have been deprived of the ordinary comforts of life, and occasionally also, as has been noticed by Simon, in acute diseases, as pneumonia and pleurisy, at a time when convalescence has barely commenced.

In those cases in which the phosphates appear in the form of strings resembling mucus, the two classes of salts are usually found mixed. The urine is then almost invariably alkaline, and more or less fœtid. The prognosis is always unfavorable in such instances, as either organic disease of the urinary apparatus, or some serious lesion of the spinal marrow is almost invariably to be suspected.

Therapeutical indications. In considering the treatment of the phosphatic diathesis, as it is sometimes called, four different pathological conditions are to be taken into account, each of which is demonstrated by a separate process of symptoms.

A. Cases in which dyspepsia, with some febrile and nervous irritation, exists independently of any evidence of antecedent injury to the spine.

B. Cases characterized by high nervous irritability with a varying amount of marasmus, following a blow, or other violence inflicted on the spine, but without paralysis.

C. Cases in which the phosphatic urine co-exists with paraplegia, the results of spinal lesion.

D. Cases of diseased mucous membrane of the bladder.

Of these it will be only necessary to direct attention to the first, second, and fourth series of cases, as in the third the deposition of phosphates is a mere symptom of a serious lesion, which, whether the result of violence, or of insidious disease, must be treated according to the particular disease existing.

The first class of cases indicative of the presence of irritative dyspepsia is by no means uncommon. The treatment must be directed rather by general principles than limited to the solution of the phosphates. The exhibition of acids is merely palliative, and rather does harm in some cases, by masking an important symptom, while the 'fons et origo mali' still continues in full force. After a certain attention to the moral bearings of the case, our principal attention should be given to the re-establishment of the general health. The bowels are to be regulated by mild mercurial laxatives, active purging being strictly avoided. When this has been accomplished, the following combination will be of use:—Tinc. hyoscyami, et Sp. ammon. aromat. āā ℥xx, et Mistur. gent. c. ℥j. Should gastrodynia exist, great relief will be obtained by the administration of the oxyde of silver in half-grain doses. As the patient approaches convalescence, considerable benefit will be derived from the sulphate of zinc in increasing doses, till four or five grains are taken thrice in the day.

The second form of the disease, which is characterized by a higher amount of nervous excitability, and by rapid emaciation, is more rare, but less

amenable to treatment than the preceding. In this form the deposit is copious, and sometimes consists nearly exclusively of the phosphate of lime. The symptoms are lumbar pain, dry skin, red and varnished tongue, great thirst, and other symptoms closely resembling diabetes. The history generally affords some evidence of a strain or hurt of the back.

In the treatment of these cases, our chief aim must be to tranquillize the brain and nervous system by narcotics, as opium or morphia, as was first suggested by Dr. Prout, after which a generous diet, with the mineral tonics, as bismuth, zinc, or silver, are called for.

[In some cases the symptoms are of a milder character, but there is a great tendency to the formation of a calculus; it is in these cases that acids are called for, but there is much uncertainty attending their use. The nitric appears the most serviceable; and the benzoic as recommended by Mr. Ure may be occasionally beneficial; but Dr. Bird puts but little faith in either, especially the latter.]

The third class of cases, in which the phosphates are in all probability secreted by the unhealthy mucous membrane of the bladder, are familiar to all, as frequently following chronic cystitis, retention of urine, from stricture and enlarged prostate. Here of course the primary disease must be treated, and not the mere symptom. It is in this form in which much good occasionally follows the injection of dilute acid into the bladder. [An interesting case, in which this mode of treatment was completely successful after every other plan had failed, is related by Dr. Bird, to whose work we refer, as our space will not allow of its extraction. Deposits of carbonate of lime, and silicic acid are occasionally met with, but not sufficiently often to render their notice of any great importance.]

ALBUMINOUS URINE.

Detection of albumen. As a general rule, if urine becomes opaque by heat, and on the addition of nitric acid, albumen is present; but if one of these tests alone be employed, there is the possibility of being misled by the following sources of fallacy:—

1. Heat will produce a white precipitate in urine, containing an excess of the earthy phosphates. *This is distinguished from albumen by disappearing on the addition of a drop of nitric acid.*

2. Heat, when applied to urine containing deposits of urate of ammonia, will sometimes, if actual ebullition be prolonged, produce a deposit of an animal matter insoluble in nitric acid. But this appearance is rare, and *is distinguished from albumen by being deposited only after protracted ebullition.*

3. Nitric acid will produce deposits in the urine of persons who are taking cubebs or copaiba; *this is distinguished by not being produced by heat.*

4. Albumen may be present, and yet not be precipitated by heat, if the urine be alkaline; *nitric acid must be used* in this case as a test, since albumen combined with alkalies is not affected by heat.

Therapeutic indications. When albumen is the only constituent of the blood present in the urine, the treatment will vary, accordingly as the kidney is merely congested or is structurally affected. [The treatment of the latter is not here alluded to, but the reader is referred to the works of Bright, Christison, &c. The management of the congested kidney, as it occurs in the dropsy of scarlatina, is thus described]:— The warm bath is the most valuable prophylactic remedy. I scarcely recollect, even in a

large experience, a case of dropsy after scarlet fever, when the warm bath has been daily used as soon as the skin has begun to exfoliate, and continued until a perspiring healthy surface was obtained. When anasarca has occurred, strict confinement to bed must be enjoined, the warm bath used twice a week, and free action of the skin encouraged. This plan must be continued until all anasarca has vanished, and the urine is free from albumen. When this has taken place, the ammonio-tartrate of iron and more liberal diet will speedily remove the anæmic condition of the patient.

BLOODY URINE.

The presence of the blood-globules in the urine may be recognised by the microscope. The treatment will vary according to the immediate cause of the hemorrhage. Absolute rest, cold to the loins, the mineral acids, and acetate of lead administered boldly, and for a short time, are our principal remedies. No remedy has, however, appeared to Dr. Bird so efficacious in the treatment of hæmaturia as the gallic acid. It should be given in five-grain doses with mucilage and tincture of hyoscyamus. (pp. 61-230.)

ART. 29. — *Palliative Emulsion in Renal and Vesical Calculus:*— M. TOTT states that after numerous trials he has found no means of alleviating the severe pains caused by the presence of calculi so efficacious as the following:

℞ Ol. oliv.	30	grammes	
Syrup. passav. alb. .	30	„	
Pulv. acaciæ . . .	8	„	
Vitel. ovor. . .	13	„	
Aquæ calcis . .	1100	„	
Tinct. opii . . .	4	„	M. fiat. Mist.

A tablespoonful to be taken every two hours. M. Tott likewise speaks highly of a mixture of 12 grammes of the lycopodium and 4 grammes of syrup of marshmallows. A spoonful to be taken occasionally. At the same time he administers enemata of assafœtida and opium.

Hufeland's Journal.

ART. 30.—*On the Treatment of Albuminuria.*

By C. S. B. WILLIAMS, M.D. Prof. of Pract. Medicine, University College.

(*Medical Times*, Jan. 18, 1845.)

Dr. Williams, in a valuable course of clinical lectures, thus expresses himself in reference to the treatment of morbus Brightii:—

The first indication is, to remove the congestion; the second, to restore the secreting function of the kidney; the third, to counteract the effects of the diseased state of the blood; and the fourth, and last, to treat the various symptoms of disease that may arise out of this disordered condition of the blood. Now the first indication will be effected by the remedies already pointed out for congestion, and more especially bloodletting. Cupping at the loins may also be applied. Bloodletting should be employed freely, in proportion to the strength of the patient and the fulness of the blood-vessels. This is to be aided by derivatives. Hydragogue purgatives tend to diminish the amount of blood in the system, and to drive out its watery parts. One of the best is cream of tartar, in large doses, or combined with jalap, but in its general effect it is better alone. One-ounce doses of cream of tartar, with half a grain of elaterium. The chief objection to this latter

is, that it is very nauseating. The indication of derivation may also be assisted by sudorifics, by warm or vapour-baths, or a hot-air bed. Tartar emetic may also be given, where the circulation is excited, and Dover's powder, so as to increase the cutaneous secretion. It is also useful, after the excessive congestion has been removed, to venture on some diuretics, on precisely the same principles that you apply stimulating lotions externally. The diuretics that answer best, are the tincture of cantharides, the tincture of digitalis, and cream of tartar, in small doses, combined with opium or tincture of henbane, to soothe any irritating effect these remedies may have. It has been supposed by some that diuretics are pernicious. I believe that they may do great harm in the early stage of congestion, as they are liable to convert it into inflammation; but after this has been removed, they come into useful operation. Cupping at the loins, and counter-irritation, may be combined, to allay any remains of inflammatory or congestive action. These may be continued until the urine loses its albuminous deposition, when they should be withdrawn. As to the third indication, that of counteracting the effects of the diseased blood, we do not know much about the means of doing this. There is a retention of urea in the blood, and we are very little acquainted with the means by which to counteract its injurious and poisonous effect; but I think it is a subject worthy of inquiry, whether matters which contain oxygen in excess will have any influence in this respect. The chief object is to evacuate it, and this is done by the measures already adverted to, hydragogue purgatives tend to remove urea, and to purify the blood. The fourth indication is one of great importance, and that is, to alleviate the troublesome symptoms. The vomiting, and other very distressing symptoms, in the early stage, may often be counteracted by medicines; diarrhea may be restrained by sulphate of copper; bronchitis by large blisters (as we treat the asthenic form of bronchial flux), together with the use of opium. The dropsical effusions are to be overcome by the different methods already adverted to,—hydragogue purgatives and diuretics. Chronic albuminuria is also connected with other structural diseases, and, in a few instances, with cancer of the kidney, and the form of yellow tubercle; but in ninety-nine cases out of a hundred it is combined with granular degeneration.

[In reference to the same subject, Mr. Kidd (*Dublin Med. Press*, Jan. 15, 1845) observes that in the chronic form of the disease our chief reliance should be placed in local depletion, as cupping in the loins, and the establishment of an issue in the same situation. He however cautions us against the promiscuous employment of the former means in debilitated subjects. Rayer (*Maladies des Reins*) has derived great benefit from the internal use of cantharides, ten or twelve minims for a dose in almond emulsion. Dr. Wells was in the habit of giving much larger doses (30 to 40 minims). Purgatives associated with diuretics are recommended by Dr. Prout. Blisters are also occasionally useful, but in general whatever treatment we may employ will be found but of temporary benefit.]

ART. 31.—*On the Efficacy of Potassæ Nitras and Acid. Benzoicum in Eneuresis.* By M. DELCOUR.

(*Journal de Bruxelles*, and *Medical Times*, Jan. 4, 1845.)

[Eneuresis nocturna, though in most instances readily cured, is occasionally seen to resist the best-devised plan of treatment. We are, therefore, induced to believe that the following observations will not be unacceptable]:

—The utility of the nitrate of potash in eneuresis was discovered by chance by M. Delcour. This physician, when called to a lady afflicted with this disease, prescribed cantharides, which, however, produced so much irritation as to necessitate its speedy omission. Nitrate of potash was given after the symptoms produced by the medicine had abated, and completely cured the patient. He also exhibited the benzoic acid with perfect success in a case in which strychnine and cantharides had failed.

Art. 32.—*Treatment of Eneuresis by Copaiba and Iron.* In the *Journal de Chimie et de Pharmacie*, Dr. Berenguier recommends the following prescription:—Balsam of copaiba 3 grammes, peroxide of iron 6 grammes. Mix and make 100 pills. One pill to be taken three times a day at the commencement; the dose to be increased until ten are taken in the day. During the exhibition of the pills, an infusion of the nux pistachia is to be used as an ordinary beverage.

Art. 33. *Incontinence of Urine produced by the Continual Use of Soda.* Mr. Ure has recorded a case in which incontinence of urine was supposed to follow a continual use of soda, as a remedy for acidity of the stomach. The case in question was cured by 4 grains of benzoic acid made into a pill with balsam of tolu, and a drachm of copaiba twice a day.

Med. Gazette, March 1845.

[It is an old opinion, that the liberal use of soda is in some manner detrimental to the genito-urinary apparatus; the sexual power in particular having been supposed to be influenced by its use. We can scarcely, however, imagine that effects so severe as in the case alluded to can be attributed solely to the employment of soda; or we should surely observe these effects more frequently, considering how very common is the custom with many persons to take this alkali upon the slightest sensation of acidity in the primæ viæ.]

SECT. VII. DISEASES OF UNCERTAIN OR VARIABLE SEAT.

Art. 34.—*Distinction between the Scrofulous and the Phthisical Diathesis.* By Dr. Chapman.*

This author is a strong advocate for the independence of scrofula and phthisis, as the following remarks will testify:

"Contrasted with the scrofulous, it may in the first place be stated, that with little of the external physiognomy appertaining to that state, it (consumption) has its own peculiar physical structure and aspect, among the features of which may be mentioned the long and delicate neck, the narrow flat chest, prominent shoulders, high cheek bones, long arms, large hands and feet, dark hair and eyes, with long tapering lashes, thick skin, and dingy complexion.

"They also differ in some particulars in the moral and intellectual constitution with which they are associated. As soon as the strumous habit becomes oppressed by disease of the organs contained in cavities (as the lungs, &c.), all vivacity is exchanged for gloom, petulance, and querulousness. The tubercular, on the contrary, sustains its original qualities

* Lectures on the more important Diseases of the Thoracic and Abdominal Viscera. By N. Chapman, M.D., &c. &c.

throughout all its stages. Further and material differences are recognised in the two affections, the strumous constitution being most prevalent in childhood, and the tubercular in mature age. The former too assails both the internal and external structures, the latter takes a centripetal direction only." (p. 24.)

[The same subject is thus discussed by Dr. Evans*]:—"Is there sufficient evidence that scrofula is identical with the phthisical diathesis? I think not, and am inclined to regard these states of the constitution as totally independent of each other for the following reasons:—

1st. I see every day numerous examples of phlyctenular ophthalmia, porrigo, rickets, and diseases confessedly peculiar to scrofulous children. I am frequently called upon to prescribe for lymphatic looking infants, with tumid upper lips, dilated pupils, swollen bellies, and enlarged cervical glands; but, upon inquiring as to the diseases to which their parents and other relations have been liable, I do not find that consumption or decline is mentioned more frequently than among any other classes of cases. I have known many large families, the members of which have all been more or less subject to scrofula in one form or another, and none of them had ever got phthisis.

2d. Upon inquiring into the early history of numerous phthisical patients, I have remarkably seldom met with persons who at any time have presented the characteristics of struma; nay, in one remarkable instance, when, out of a family of eighteen members fourteen died of consumption, not one ever presented a symptom of scrofula, unless acute hydrocephalus in one child could be considered as such.

Beer has distinguished between the phthisical and scrofulous diatheses with his usual acumen, and Mackenzie remarks that "it requires but little experience to observe that those individuals whose texture is extremely lax, with the nose and upper lip constantly swollen and scurfy, the abdomen distended, and who are commonly affected with chronic swellings of the lymphatic glands, form a sub-class sufficiently distinct from the subjects of tubercles in the lungs; the latter are lively and irritable, and are rarely affected with the external lymphatic swellings, the crusta lactea, tinea capitis, ophthalmia tarsi, &c., to which the former sub-class are so liable."

"For these reasons, I think it very doubtful whether the characteristics of ordinary scrofula can be considered as evidences of the existence of a phthisical predisposition." (p. 189.)

[On the other side of the question, many authors of consequence might be cited, and among them, Sir J. Clark, Hamilton, Andral, Canstatt, &c. But M. Lugol† is the latest writer who has minutely considered the subject, and we shall therefore transcribe a few of his observations]:—

"The identity of scrofula and pulmonary tubercles is, in our opinion, most manifest; they have both an hereditary origin, and are equally general and fatal in the affected family. The two latter characters which belong to each of these diseases in an equal degree, are in themselves sufficient to establish their identity; but we shall endeavour to render the fact still more evident by demonstrating—first, that scrofula has frequently a tubercular origin; second, that the two diseases ordinarily coexist in the same family; and third, that all scrofulous subjects have tubercles in the lungs.

"1st. More than half the subjects of scrofula have consumptive proge-

* Lectures on Pulmonary Phthisis. P. 189.

† Researches and Observations on the Causes of Scrofulous Diseases. Translated by W. H. Ranking, M.D. Cantab.

nitors. Scrofulous diseases of all kinds, invade a family without the operation of any other cause than the existence of pulmonary tubercles in one of the parents.

"So general is this fact, that, in a ward containing 84 beds, [in which there is a continual influx of fresh patients, Ed.,] we have constantly ascertained the existence of consumption in one or other of the parents of more than half the patients; and even this is below the real proportion, for a great many patients are utterly ignorant of the sanitary condition of their families, and in other cases the presence of consumption has been overlooked, because it was not accompanied by its more manifest signs.

"2d. The preceding observations are still further justified by the frequent coincidence of scrofulous diseases and pulmonary consumption in the same family. [Here cases are given in confirmation.] In scrofulous families, children often perish from disease in the lungs; and again, in consumptive families, some of the members are carried off by various forms of scrofulous disease.

"3d. Scrofulous children in the ordinary sense of the word—that is, children who are regarded as *scrofulous* and not *tubercular*—are, nevertheless, as much the subjects of this deposit as those in whom tubercle has concentrated itself in the respiratory organs. *The natural death of the scrofulous is by consumption;* we might say, indeed, that they seldom die in any other way, for in all forms of scrofula, death rarely takes place until after the invasion of the lungs by tubercular deposit." (p. 48.)

Art. 35.—*Physiological and Pathological Researches on Tuberculosis.* By H. Lebert, M.D.

(*Müller's Archives*, 1844. *Abridged from Lancet*, Nov. 7, 1844.)

The following quotations form the principal features of a summary which is appended to a very valuable paper on this subject:—

1. The constant elements of tubercle are, molecular granules, an adhesive hyaline mass, and peculiar tubercle-cells of irregular form, containing no nucleus, but molecular granules. Water, ether, and weak acids, scarcely induce any change in tubercle. Concentrated alkalies, liq. ammoniæ, dissolve them completely.

2. Tubercle-corpuscles consist of cells having a very low power of development.

3. The opinion that tubercular substance is a modification of pus, is contradicted in the most positive manner by the microscope.

4. Tubercle-corpuscles are distinguished from undeveloped pus-globules, by the spherical form and greater diameter of the latter. Cancer-cells are clearly distinguished by their larger size, and these contained nucleus.

5. The pus which surrounds softened tubercle never originates as does the tubercle itself, but is formed directly in the surrounding parts.

6. Tubercle becoming hard and calcareous, is a natural process of cure. The peculiar elements of tubercle become in part absorbed, and in their place small mineral granules and sometimes granules of cholesterine are deposited.

7. The seat of tubercle in the lungs is generally the elastic cellular tissue, but it is also formed in the air-vesicles and capillary bronchial tubes.

8. The pneumonic engorgement surrounding tubercles does not possess specific characters, it exhibits the same elements of exudation, as ordinary pneumonia, viz., aggregate globules, fat-vesicles, pus-corpuscles, &c.

9. The gray semitransparent granulations of the tissue of the lung are also a true form of tubercle.

10. The opinion that the gray granulations are the result of inflammation is opposed by positive observation.

11. The tubercular ulcer of the lung is not physiologically different from the tubercular ulcer of the skin.

12. The natural effort towards the cure of a tuberculous cavity is by the formation of a true pus membrane, consisting of filaments enveloping small corpuscles.

13. The healing of caverns also takes place by mineral deposition.

14. In the sputa of phthisical patients, the following elements are found: *a*, mucus; *b*, pus-corpuscles; *c*, epithelium in its various forms; *d*, granular substance, probably broken-down tubercle-corpuscles; *e*, filaments of the lung; *f*, fat-vesicles; *g*, blood-corpuscles; *h*, occasionally small infusoria.

15. Regular tubercle-CELLS are not commonly found in the expectoration of phthisis. There is no constant means of distinguishing phthisical from other sputa.

16. The law fixed by Louis, that after the age of 15, the lungs contain tubercles when they are present in other organs, is substantially correct.

17. Tuberculosis of the osseous system is a much more rare disease than is generally supposed. A mistake is often made between concrete pus and tubercular matter. In doubtful cases the microscope can alone determine the diagnosis.

18. Tubercles and cancer do not interfere with or exclude each other. Both mobid processes may run through the different stages of their development at the same time.

ART. 36.—*On the Topical Application of Cod-liver Oil in Strumous Affections.* [The medicinal qualities of this substance, if we are to believe the reports of the German physicians, who appear to have given it an extensive trial, are of a high order.] Dr. Brefeld has lately published a Memoir recommending the local application of the oil in certain scrofulous affections, as in glandular engorgement, ulcerations, &c. The preparation used by him is as follows:—

℞ Cod-liver oil 15 grammes
Saturnine extract 8 ,,
Yelk of eggs 12;

mix intimately. This ointment is applied to the ulcers thinly spread upon lint. In strumous ophthalmia, M. Brefeld anoints the edges of the eyelids several times a day with the undiluted oil. In mesenteric disease the oil may be rubbed into the abdomen either warm or cold, as is most suitable to the feelings of the patient.

Journal de Médecine. Fev. 1845.

ART. 37.—*On the Influence of Warm Climates in the Cure of Diabetes.*

By KEITH MURRAY, M.D., Fellow of the Royal Coll. of Physicians, Edin.

(*Edin. Med. and Surg. Journal*, Jan. 1845, p. 83.)

[In spite of the great advance which pathological inquiry has made of late years through the instrumentality of organic and vital chemistry, diabetes still continues to be one of the chief "opprobria medicinæ." We hail, therefore, with peculiar satisfaction any information which is calcu-

lated to encourage us to perseverance in the treatment of a disease in which repeated failures too frequently tempt us to look on in despair, or at least, to attack it without method or energy. Of this kind is the excellent paper of which we shall now proceed to give an abstract]:—

"The almost constant fatality of diabetes, even in the hands of the most experienced medical men, and under the most favorable circumstances, clearly demonstrates that in our moist and cold climate, there are no means of cure, however well conducted, on which much reliance can be placed.

"None of the means which have been proposed appear so likely to ensure success as the exclusive use of animal diet, first suggested by Dr. Home, of Edinburgh, and afterwards strongly advocated by Rollo and others. But this method has lost the high character which it once held. Though there can be no doubt that it diminishes the quantity of urine, and renders it less saccharine, yet it can only be considered as a powerful means of palliating the disease. Whether a permanent cure could be accomplished by a long-continued use of animal food alone, cannot be easily ascertained, for few patients have sufficient self-control to continue this diet for any length of time.

"Dr. Watts's treatment by bloodletting never raised such high expectations of success as that of Rollo. There can be no doubt, however, that venesection is useful at the commencement of the disease; but it requires to be carefully regulated according to the strength of the patient, fulness of the pulse, and other circumstances of the case. Benefit has also been derived from cupping on the loins when pain has been felt in that situation.

"Opium, if given in large doses, determines strongly to the skin, renders the thirst less urgent, and diminishes the quantity of urine, while it calms the uneasiness and mental anxiety of the patient.

"The employment of diaphoretics is naturally indicated by the dry and harsh state of the skin, which is one of the most constant symptoms of the disease.* The greater number of cases of diabetes on record appear to have proceeded from suppressed perspiration, or some cause acting upon the skin and disordering its functions. The suppression of the cutaneous discharge is one of the earliest symptoms, and it has invariably been remarked, that, whenever the disease begins to give way, the first symptom of amendment is a change in the state of the skin, which becomes soft and moist; and that the diminution of the saccharine matter always keeps pace with the progress of the skin towards a healthy condition.

"Dr. Christie, finding diabetes a much more manageable disease in Ceylon than in this country, proposed the employment of an artificial temperature. But to confine a diabetic patient to a warm room would tend much to increase the languor and despondency which always accompany the disease.

"In warm climates, where the skin is constantly in a relaxed and moist state, diabetes is a rare disease. Dr. W. Hunter, during a long residence in Bengal, did not see a case there. Dr. Prout is of opinion that malaria has considerable influence as an existing cause of diabetes. If this were the case, we might expect to find it a common disease in tropical countries where malaria abounds. However, during seven years extensive practice in the West Indies, where malarious diseases were the chief cause of mortality, I never saw or heard of a case of diabetes.

* Not an invariable one however; we can call to mind two fatal cases within the last twelve months, accompanied throughout by profuse sweating.—Ed.

[The annexed cases appear, as far as their limited number goes, to afford the strongest evidence of the beneficial influence of a tropical climate, and are well calculated to arrest the attention of the reflective practitioner]:—

Case 1. M. J. Z., middle height, fair complexion, applied to the author, at Dominica, in 1828. Five years previously he had caught a severe cold in England, and diabetic symptoms were fully established. While passing twenty pints of saccharine urine daily, he sailed for the West Indies. During the passage out he suffered severely from sea-sickness, which caused him to perspire freely, with evident diminution in the quantity of urine. A fortnight since, he was exposed to cold and damp, and the diabetic symptoms returned in full force. When seen, his thirst was urgent, and his urine so saccharine as to attract the flies—quantity, nineteen pints.

[This case completely recovered under the use of Dover's powder and tartar emetic. The next instance is still more conclusive of the effects of warm climates.]

Case 2. M. F., æt. 25, of spare habit, clerk to a writer of the signet, had a severe attack of pleurisy three months ago, and was bled profusely; since this he has felt weak; he eats voraciously, and is troubled with thirst. Passed 16 pints of sweet urine during the last 24 hours. April 17th. Has lived on animal food since last report. Urine diminished to 10 pints. Ordered a warm bath twice a week, and to take 60 drops of laudanum and a grain of tartar emetic in the day. From this time the symptoms underwent several variations, the urine being sometimes as high as twenty, at others as low as four pints—and although upon the whole he was considerably improved by the 30th of May, he was far from well, and liable to relapse upon the slightest dietetic error.

At this time, hearing that he had relations in Jamaica, he was persuaded by the author to try the effect of a warm climate. He accordingly sailed, and arrived after a tedious voyage, and having suffered severely from sea-sickness. Under the perspiration induced by the nausea and vomiting, the urine was diminished to nearly the natural quantity. In three months after his arrival, he had gradually recovered. His urine returned to its normal quantity, and ceased to ferment on the addition of yeast. His skin became soft and prespirable, and increased 12 pounds in weight. He was in good health two years afterwards.

Case 3. M. F. R., law student in Paris, caught cold in Nov. 1836, which left him severely depressed in spirits. Complained much of thirst, and consulted Dr. Imray for that symptom. The patient is 26 years of age, and a native of the Mauritius.

Feb. 10th. Urine 15 pints, of a pale straw colour, and ferments with yeast. As his health did not improve after six weeks treatment, Dr. Imray advised his return to the Isle of France. He sailed from Havre about the middle of March. In the course of six months after his arrival, his diabetic symptoms disappeared, without the use of any internal medicine beyond an occasional aperient.

[Three other cases are given which are equally conclusive with the preceding, as to the value of tropical climates in the treatment of this fatal disease. The author concludes his interesting essay in the following words]:—

"Success in a few cases does not authorize me to draw a strong conclusion; but I am nevertheless much impressed with the belief that residence in a warm climate, conjoined with proper regimen, will hereafter be found to possess greater influence over diabetes than any other remedial means hitherto proposed."

Art. 38.—*Case of Diabetes Mellitus successfully treated.*—Dr. Van Ness relates the annexed example of the fortunate termination of this usually fatal disease. "A labourer, æt. 46, previously in robust health, began in the summer of 1838 to complain of being readily fatigued, and of perspiring profusely at his work. His digestion was at the same time much impaired, being accompanied with acid eructations, and a sense of weight and sinking at the stomach; his urine is excessive in quantity, he is cachectic in appearance, and tormented with continual thirst. Evaporation of the urine afforded a large quantity of diabetic sugar. The diagnosis of the disease being thus distinctly established, Dr. Van Ness placed him upon a restricted animal diet, and at the same time exhibited the Peruvian balsam in half-drachm doses three times a day, increasing the quantity progressively. Under this treatment the patient rapidly amended, and in five weeks was entirely cured. The patient at the time his case was reported had become perfectly robust, and his urine was passed in a natural quantity and of healthy specific gravity.

Hanov. Annalen, 4—5, 1844, *in Schmidt's Jahrbücher*, 1, 45 Band, Heft 1.

Art. 39.—*On the Differential Diagnosis of Gout and Rheumatism.* By Charles Mackin, M.D.

(*Lancet*, March 22, 1845.)

"On an accurate comparison of the phenomena of rheumatism brought into juxta-position with those of gout, we shall find sundry material differences, and a numerous train of minor points of distinction interesting both to the pathologist and the practitioner. The following table will serve in a general manner to illustrate this assumption.

Gout.	*Rheumatism.*
1. Is rare in females, who indeed are seldom attacked by the disease in a strict and uncomplicated form.	1. Is frequent among females, especially those who are necessarily exposed to its causes.
2. Is scarcely ever seen prior to the age of manhood.	2. Is common to all stages of life, except perhaps infancy.
3. Is generally, though not always, induced by high living, free indulgence at the table, &c.	3. Is more frequent among the lower orders, and those to whom poverty and privation are familiar.
4. Is hereditary, descending from father to son, sometimes missing one generation.	4. Is not hereditary,—at least not obviously so.
5. Affects the smaller joints, although the larger are often attacked. The parts abounding in fibrous tissues, as the sole of the foot, are seldom attacked by true gout.	5. Affects the larger joints and fibrous tissues.
6. Less frequently becomes chronic.	6. Has great tendency to become chronic.
7. Subsequent to the paroxysm the patient is improved in general health, that is, comparatively.	7. Subsequent amelioration not so evident.
8. Metastasis to other joints (common), to the stomach (fre-	8. Metastasis to other joints (always), to the stomach (rare), to mem-

Gout.	*Rheumatism.*
quent), to the membranes of the brain (rare), to the pericardium (scarcely ever).	branes of the brain (frequent), to the pericardium (very common).
9. Cornea, the most frequent seat of gouty inflammation of the eye.	9. Rheumatism chiefly attacks the sclerotic coat.
10. Localization of gout not preceded by rigors.	10. Rheumatic arthritis generally preceded by rigor."

[The author might have added, gout frequently induces tophaceous deposits in the joint; rheumatism never.]

SECT. VIII. DISEASES OF THE SKIN, ETC.

ART. 40.—*General Principles of the Treatment of Skin Diseases.*

By M. DEVERGIE.

(*Bulletin de Thérapeutique.*)

[In order to simplify a class of diseases which, more than any others to which the human frame is subject, has been confused by tedious and uselessly minute subdivision, M. Devergie divides them into two great classes; those which give rise to a secretion, and those which do not secrete. He thus proceeds]:—

1. "The maladies of the first class are, with the exception of acne, in general, inflammatory at their onset. They have, as in the instance of other inflammatory affections, a period of increase, a stationary period, and one of decrease, each of which periods requires a special mode of treatment. The first period is to be met with a purely antiphlogistic regimen, the latter by those medicines which excite a resolution of the morbid product; the intermediate period should be one of comparative inactivity on the part of the physician. Thus, *eczema*, *pityriasis rubra*, *pemphigus*, *ecthyma*, and *sycosis* require in the first instance an antiphlogistic treatment proportionate to the strength of the patient.

"The third indication ought never to be attempted until all inflammatory action has ceased. A certain degree of tact is likewise necessary in the application of remedies of the nature required, for some diseases appear to have certain predilections, so to speak: some will not bear fatty or oleaginous applications, but are readily cured by lotions. Knowing this fact we are able to suit our remedies to the disease, in one case using an ointment, in another a lotion. Much depends upon the management of the strength of the external applications. An ointment which may be inert in one stage of the disease will be too irritating in another. It is always advisable to begin with a feeble application and gradually to increase its strength. *Sulphur* and *iodine* should be avoided at the onset of diseases accompanied by secretion.

"We must not forget in the treatment of these diseases to remove the exciting causes. For example, we shall strive in vain to remove *eczema* and *impetigo* in bakers, grocers, &c. while they continue to be employed in their trade; so likewise with the internal causes. *Rupia* and *ecthyma cachecticum* are constantly allied with misery and want. In these cases, good food and tonic medicines are indispensable. *Impetigo*, *acne*, and

eczema impeteginodes are generally the diseases of the lymphatic constitution, and therefore require the treatment which is necessary in scrofula.

"Skin diseases of this class also require a modification in their treatment according to the patient's age. As a general rule, a secreting skin affection should be treated with circumspection in the infant, and we ought not to seek to cure it until it has become chronic. Cerebral symptoms are frequently known to supervene upon the sudden removal of the *crusta lactea*.

"There are cases also in which a disease of the skin ought not to be cured in old age if it be of small extent; as for instance, in asthma and bronchial catarrh. We have often seen a fatal pulmonary disorder arise when a skin disease has been too speedily removed; and such cases will resist every effort to save the patient. We shall seek in vain to restore the eruption by topical stimulants, as mustard, cataplasms, &c.

"There is, however, an age at which the very opposite line of treatment should be recommended. A great number of cutaneous affections develope themselves in young girls about the age of puberty, especially in those in whom menstruation is tardy: it is too often customary to allow the disease in those cases to run its course, under the impression that it is a salutary effort of nature. I cannot too strongly urge the fallacy of the opinion, for in the majority of cases, a cutaneous disease which establishes itself at this period becomes most rebellious, and continues for years to resist the most plausible treatment."

II. "The non-secreting diseases of the skin, like the former class, occasionally appear in the acute form, in which case they also require the antiphlogistic treatment, but in reality this should be palliative rather than energetic. In *erythema*, *urticaria*, *lichen*, *strophulus*, *herpes circinnatus*, *lepra* and *psoriasis*, repose is in general all that is necessary to abate the active symptoms, and indeed this in some cases should be rather encouraged, especially if there be much fever and the eruption is scanty. Some of the non-secreting diseases require a special medication. There comes a period in all these diseases in which they remain stationary under palliative treatment, a circumstance which indicates the necessity for the remedies which will hereafter be mentioned.

"The second class of diseases, like the first, cannot always be cured with impunity, especially those which are accompanied by great itching. The prurigo senilis is an instance in point. The means which are most generally successful in *prurigo* are the "pommade d'helmerich," sulphur baths, and sulphur internally; but these remedies must be employed with discretion, for we have seen abscesses in the groin and axillæ, ophthalmia, and other accidents follow the too rapid removal of the pruriginous affection.

"The preparations of sulphur are the basis of the best medications for *prurigo;* alkalies are the most efficacious of all the medicines for *lichenous* eruptions. Of these the bicarbonate of soda internally, or three in the dose of two drachms per diem, together with alkaline ointments, will generally be successful. In the formation of the ointment it is advisable to dissolve the salt in a small quantity of water previously to mixing it with the fatty matter, otherwise it is apt to irritate the skin from being unequally distributed through the ointment.

"*Lichen agrius*, however, forms an exception to the general treatment of this class of diseases. In this disease the tincture of cantharides will be found to be the most efficacious method for internal exhibition, and vapour baths externally.

"The treatment of the scaly diseases is comprised in the exhibition of the arsenical or antimonial medicines. The external means most likely to succeed is an ointment, containing tar, white precipitate, or sulphur, and simple or alkaline baths. Each of these remedies will be separately considered in a future paper."

ART. 41.—*Formulæ recommended by Biett, in Various Forms of Skin Disease.**

1. For porrigo decalvans:

Take marrow of beef bones, ʒvj.
Oil of sweet almonds, ʒij.
Red bark in powder, ʒj.
To be well mixed and melted to form an ointment.

2. For impetigo:

Take syrup of wild pansy, ʒxij.
Subcarb. of soda, ʒij.

Mix; one table-spoonful to be taken night and morning. At the same time, the patches are to be poulticed with a linseed cataplasm containing ʒj of sublimed sulphur.

3. In chronic eczema of the scalp:—

To drink every day, gradually increasing the dose, two spoonfuls of the following mixture:—

Infusion of scabious, Oj.
Nitric acid, ℈ij.
Syrup of marshmallow, ʒiij. M.

To wash the scalp two or three times a day with the following lotion:—

Sulphuret of soda, ʒiij.
Spanish soap, ʒss.
Alcohol, ʒij.
Lime water, Oj. M.

4. In porrigo lupinosa:—

To detach the crust with potato poultices:—

To wash the head with bran water, containing ʒij to the pint of subcarbonate potash:—

To rub the parts with the following ointment:—

Deuto-ioduret of mercury, grs. xviij.
Camphor, grs. xij.
Lead, ʒj. M.

ART. 42.—*Summary of the History of Syphilitic Eruptions.* By M. GIBERT.†

The author of the useful treatise from which the following abstract is taken, enters upon the consideration of the syphilitic skin diseases by a short review of the phenomena attending the primary affection. After a few remarks which seem to be addressed, for the most part, in opposition to the opinions of M. Ricord, he proceeds to state that all the different forms of syphilitic eruption may be reduced to the same classification as those depending upon ordinary causes. Thus we have an *exanthematous* syphilide (syphilitic roseola); a *vesicular* syphilide, confessedly rare; a *bullous* syphilide (syphilitic rupia); a *pustular* syphilide (syphilitic ecthy-

* Practical Treatise on Diseases of the Skin, by H. Gibert. Translated by Sheppard, 1845.
† Ibid. P. 338, et seq.

ma); a *tubercular* syphilide; a *papular* syphilide (syphilitic lichen); a *scaly* syphilide (syphilitic psoriasis and lepra), very often consequent to blenorrhagia [? Ed.]: a syphilide showing itself in stains and patches; and the *ulcerated* syphilide, which may constitute a primary form (primary sore), but which in many cases succeeds to one of the elementary forms just described.

Although there is considerable resemblance between the syphilitic eruptions and cutaneous diseases of another nature, there are always distinctive marks common to all the *syphilides*, and which are so characteristic, that an experienced observer can never mistake them. The *coppery hue* is one of the most certain of these; it may be found in all the forms of cutaneous syphilis, although it may not always be equally apparent, especially to an inexperienced eye. The *ulceration* which succeeds to many species, has also so characteristic an appearance, that it is impossible to mistake its nature. These ulcers are deep, round, callous, and as it were cut out perpendicularly, or they are serpiginous, forming spiral lines and the segment of a circle, and they are covered with dark green *crusts*, which are fixed deep in the dermis. The *cicatrices* are also peculiar, being unequal, spiral or rounded, white and depressed.

In the treatment of syphilitic skin diseases, mercurial preparations are the principal remedies; of these we continue to prefer *Van Swieten's* liquor, or the solution of *corrosive sublimate*, in constitutional syphilis. The best effects are also to be derived from *cinnabar fumigations*, either general or partial, the most rebellious cutaneous diseases sometimes healing under their use. M. Biett, at the hospital of St. Louis, was partial to the employment of corrosive sublimate in pills, after the method of *Dzondi*, commencing with $\frac{1}{20}$ of a grain, gradually increasing the dose to one or two grains in the day. The effects of this plan have frequently been most happy in severe and even hopeless cases.

Mercury frequently having irritating effects, which may become injurious in certain subjects, other remedies must occasionally be substituted, the *muriate of gold* has had marked success in some cases, but it is not employed with any great confidence. It is exhibited by means of friction on the tongue, in doses of $\frac{1}{8}$ to $\frac{1}{4}$ of a grain mixed with some inert powder.

Sudorifics have sometimes been employed successfully in constitutional syphilis. It is thus that guaiacum, sarsaparilla, mezereon, *Feltz's* tisan, *Zetman's* decoctum, and *Arnould's rob*, into which the sulphuret of antimony and aromatic substances commonly enter, have produced the best effects in the hands of good practitioners.

Narcotics, particularly opium, are often useful as auxiliaries, and may even be employed alone in cases where mercurials have failed. Bloodletting and other antiphlogistic remedies, can only be admitted as adjuvants under particular circumstances.

Regimen is always a means of treatment of the highest importance in constitutional syphilis; it forms an indispensable auxiliary when *Dzondi's* plan is adopted, or when *Feltz** or *Pollini's*† *tisan* are given.

Patients tainted with inveterate syphilis frequently fall into a state of

* *Feltz's tisan*:—

Take cut sarsaparilla, ℥iij; isinglass, ℥ss.; gum arabic, ℥ij; sulphuret of antimony, ℥iv; water, Oxij. Macerate for 24 hours; boil till it is reduced to half, the ingredients being suspended in a bag; then strain. *Dose*, Oiss. daily in three glasses.

† *Pollini's tisan*:—

Take pounded green walnut shells, lb. j; sarsaparilla root, ℥iv; powdered pumice-stone, ℥iv; persulphuret of antimony, ℥iv; water, Oxx. Boil to half. *Dose*, Oss daily, in three portions.

cachexia, and become severely affected by *specifics*, if we do not modify this condition, at the commencement, by judicious hygienic treatment.

The syphilitic poison, when inherited by the child, always declares itself in the form of an eruption. It usually shows itself towards the close of the first or at the beginning of the second month after birth. It has its seat at the perineum, and the internal surface of the thighs, in the form of *flat tubercles*, or syphilitic *ecthyma*, and from thence it spreads over a variable extent of the integuments. A little later the mucous membranes become affected, particularly the mouth and the labial commissures; it is at this time that, if the child is confided to a nurse, the nipple of the latter ulcerates, and the disease is communicated to her thereby.

Syphilis in the new-born infant is always a severe malady. Nevertheless, if the child be otherwise well constituted, and both it and the nurse are submitted to proper treatment, a cure is easily obtained. We generally confine ourselves in children to the employment of topical applications, such as the following:—

Opiate cerate, ℥j.
Ammoniacal oxychloride of mercury, ʒj.
To make an ointment.

Care is taken at the same time to prescribe emollient baths, and to see that the infant is properly cleansed. If the child be at the breast, the nurse is made at the same time to take corrosive sublimate internally, as in the subjoined pills:—

Extract of aconite, grs. xij.
Powdered opium, grs. ij.
Bichloride of mercury, grs. ij.
Mix and divide into eight pills, one to be taken each morning.

As to adults afflicted with syphilitic eruptions, we generally restrict ourselves to the use of simple, alkaline, or sulphur baths; prescribing at the same time the bichloride or the ioduret of mercury. If the disease resists, we have recourse to the plan proposed by *Dr. Scatigua*. This consists in placing a drachm of strong mercurial ointment in the axilla. This is repeated the next day, and the patient then takes a bath, after which the proceeding is recommenced. I have seen an individual affected with *tubercular syphilide*, with indurations in the mouth, in whom the disease was cured by this method, after obstinately resisting the corrosive sublimate, the iodide of mercury, and Larrey's syrup.

ART. 43.—*On Local Applications in Cutaneous Diseases*. By M. CAZENAVE.

(*Annales des Maladies de la Peau, Encyclograp. Med.* Sept. 1845.)

[The name of M. Cazenave is favorably known as that of the author of one of the best, if not the very best, practical treatise of Skin Diseases extant. Being one of the physicians of the hospital of St. Louis, and the successor of M. Biett, his remarks are invested with peculiar authority]:—

"The application of topical remedies is without contradiction the most important part of the treatment of many forms of cutaneous disease. It is equally certain that the choice of the proper local application is a matter oftentimes of great difficulty. The sulphur ointment, which is so frequently and indiscriminately used, does not suit all eruptions; and again, an application which is useful in the decline of the disease, aggravates it in the commencement; another may be satisfactory to-day, and disappoint us to-morrow. Some eruptions are intolerant of greasy applications, others of

lotions. This susceptibility of the skin of certain persons and in certain diseases, requires to be well considered before we decide upon the use of external medicines.

"It is also a matter of the utmost consequence, to pay great regard to the actual condition of the eruption. Unfortunately, however, this point is too often lost sight of, for we continually see on the one hand an irritating ointment, or a sulphur bath, prescribed for a disease in which active inflammation of the dermoid tissues is going on; and, on the other, emollient applications in the chronic stage of a disease, where stimulating applications are required. It is the proper understanding of this part of the subject, the time at which such and such ointments may or may not be used, that renders one medical man so much more successful in the treatment of skin diseases than another.

"As a general rule, none but emollient applications are suited to the treatment of skin diseases accompanied by inflammation; but, on the other hand, these should not be too long persisted in, for they tend to enfeeble the texture of the skin and render it flabby. Greasy applications, for the most part, are hurtful in all the acute forms of cutaneous disease. This is especially the case in *lichen* and *eczema*.

"Certain forms of eruption are more tolerant of local applications than others. For example, *psoriasis lepra*, and the drier forms of *herpes*, &c. are advantaged by them; in eczema, on the contrary, they cannot be used without great precaution. *Lichen*, on the contrary, rarely bears lotions or ointments of any kind; neither do the pustular eruptions, unless they have become chronic, and give rise to thick adherent scabs. Certain other forms of disease imperatively require local medication, such as *scabies* and *lupus*, and the '*syphilides*.'

"We see, therefore, that in practice as well as in theory, it is impossible to classify diseases in such a manner as to bring them under a specific mode of treatment. As a general proposition, however, I would state that, in the majority of the diseases of the skin, contrary to the received opinion, topical applications are of secondary importance, in some they even delay the recovery; and that it is to internal medicines that we are to trust, to obtain a radical and complete cure."

[The author concludes this portion of his remarks by the observation, that he now generally replaces emollient applications, as poultices, &c., by the powdering the affected part with starch or oxyde of zinc. We have long been in the habit of doing the same thing with the greatest benefit, in the more acute stages of eczema, and all diseases accompanied by copious secretion. The application we prefer, is finely-powdered magnesia, or flour, and the nitrate of bismuth, in equal parts. We have found this invaluable in the intertrigo to which children are subject, in the sore nipple of nurses, and in superficial burns.]

Art. 44.—*On the different sorts of Caustics.* By M. Cazenave.

(*Annales des Maladies de la Peau*, Oct. 1844; and *Méd. Chirur. Review*, April 1845.)

The powder of Dupuytren is composed of one part of arsenious acid and 200 parts of calomel. It is a mild and very manageable caustic, and will be found serviceable in cases of lupus occurring in women and children, when the ulceration is superficial and of limited extent. If the diseased part be dry, it may be necessary to denude it by means of a blister, and then to sprinkle the powder upon the raw surface. A certain amount of heat and

pain is usually caused by the application. When the eschar becomes detached, there is generally observed to be a decided modification of the diseased surface, and a few applications are in many instances sufficient to effect a cure.

The *Vienna* powder and *paste* are caustics of great power in certain cases of lupous ulceration. They are composed of equal parts of powdered quicklime and potassa c. calce. In using it, it is made into a paste with spirits of wine, and applied upon the diseased part, which is previously exactly circumscribed by a hole cut into a piece of sticking plaster. The paste is to be left on for ten or twenty minutes, according to the depth of the eschar required.

The *chloride of zinc paste* is much used in the present day. It is made by mixing one part of this substance with two or three of flour, and moistened with as little water as possible. The pain lasts for several hours. M. Cazenave frequently has recourse to this caustic to destroy non-ulcerated lupous tubercles.

[The directions for using this caustic are not here well defined; and, as it is one of great power, and requiring delicate management, we shall detail the precautions which a considerable experience in its employment has suggested. The paste is to be made as above directed, but should not be applied thicker than one or two lines, nor left on longer than from six to ten hours. An application of one line in thickness for ten hours, will, in some cases, form an eschar of nearly a quarter of an inch in depth, so that, as may be imagined, it is not a caustic to be lightly or carelessly employed. As far as we have observed, the pain is of a very endurable character compared with that of the arsenical paste, or the nitric acid. We know of no caustic to be compared with it in the doubtful looking ulcerations which are met with in various parts of the body.]

In cases of long-standing corroding lupus, M. Cazenave gives the preference to the arsenical paste, its action being two-fold, local as a caustic, and general, by being absorbed, and exercising a potent alterative or modifying action upon the economy. The following is the formula:—

White oxyde of arsenic, 2 parts.
Sulphate of mercury, 1 part.
Animal charcoal, in powder, 2 parts. Mix.

When used, a small quantity of this powder is to be made into a thin paste by a few drops of water, this is placed upon the surface to be acted upon, which should never exceed the size of a franc-piece. This caustic not only produces sharp pain, but also a severe erysipelatous swelling, which lasts for several hours, and is sometimes accompanied by severe constitutional disturbance.

Fluid caustics. M. Cazenave frequently makes use of a weak solution of the sulphate of copper, or of the nitrate of silver, in the treatment of favus and tinea.

One of the most potent of the fluid caustics is the *acid nitrate of mercury*. When used undiluted, it acts as a mere caustic, but when considerably weakened, it is absorbed. It is chiefly used in superficial lupus.

The erysipelatous inflammation which is excited by these caustics, need not be much dreaded; indeed, in some cases the cutaneous phlegmasia appears to be decidedly beneficial, and is therefore in some cases purposely excited as a means of hastening the resolution of obstinate lupoid tubercles.

Art. 45.—*Lupus cured by Ol. Jecoris Aselli.* This case occurred in the person of a young female, æt. 20. The face was eaten away by tuber-

culous ulceration, the fleshy parts of the nose being completely destroyed. Independently of this, there existed scrofulous abscesses in the neck, caries of the molar bone, white swelling of the wrist. All these severe lesions are now completely cured, after the employment of iodine internally and externally, and caustics of various kinds by the internal and external use of cod-liver oil. The treatment was continued for more than a year. M. Gibert, in relating this case, very properly observes, that no benefit can be expected in the treatment of scrofula, without time and perseverance.

Bulletin de l'Académie, Nov. 1844.

ART. 46.—*Warm Water as an External Application in Eczema.* Mr. Phillips has found the above a most efficacious application in that intractable form of skin disease—chronic eczema. The case here reported was unusually severe, being of six years' standing; the skin being thickened and hardened and fissured in every direction. It completely yielded to the above treatment in four weeks, leaving the skin soft and pliable. The case was that of W. K., æt. 49, admitted into the Westminster Hospital under the care of Mr. White. The limb was hypertrophied to such a degree as to have some resemblance to the Barbadoes leg. No former plan of treatment had been of any use.

Ordered to take Hyd. chlorid. grs. v, Pulv. jalap. grs. xv, twice, with an interval of two days. The limb to be bandaged with bandages dipped in warm water, the whole to be covered with oiled silk so as to form a constant tepid bath. To take Liq. arsenicalis ♏ v, twice a day.

Under this treatment the integument had become soft and smooth in three weeks, and in six weeks he was discharged cured.

[The Editor has long been in the habit of employing a modification of the above plan with much success, the application made use of by him being fresh cream, with liq. plumbi, instead of water. The oiled silk forms the most important part of the plan.]

Med. Gazette, March 7, 1845, p. 722.

ART. 47.—*A New Depilatory in Tinea.* The principal obstacle to the cure of the porriginous eruptions of the scalp consists in the difficulty of removing the diseased hairs, the persistence of which constitutes greatly to the maintenance of this disease. Various formulæ have at different times been proposed in order to effect this object, but none that we are aware of can be considered as free from objection. The pitch cap is but the remnant of that barbarism which appears in some instances to have clung to the healing art long after it had lost its hold upon other institutions, the process of the Brothers Mahon, though mild in its operation is tedious, and from the nicety with which it must be used, and the ceremony which it involves, renders it one which we can seldom carry into operation in private practice. We are, therefore, happy to have the opportunity of recommending a new formula, which its inventor, M. Boetgerr, of Frankfort on the Maine, states to be most efficacious and speedy in its operation :—

This depilatory consists of the "sulpho-hydrate of the sulphuret of calcium," and is made by passing sulphuretted hydrogen to saturation through a mixture of two parts of slaked lime, and three parts of water. The result is a jelly-like substance of a blueish green colour. It is sufficient to apply a layer of this of a line in thickness to the parts to be denuded, when in the course of three minutes the hair will be entirely removed without the least injury to the epidermis, and without causing the slightest pain.

Journal de Médecine de M. Beau, Dec. 1844.

VARIA.

ART. 48.—*On the Endermic Use of Purgatives.* M. Salques makes the following practical remarks respecting the employment of purgatives :—

"There are many cases both of acute and chronic disease, in which, although it is distinctly of importance to relieve the bowels, yet the irritability of the stomach is so great as to preclude the ordinary mode of exhibiting aperient medicine. Injections too frequently fail in their object, as they cannot pass the accumulation of hardened fecal matter. In such instances we have frequently recommended the recurrence to the endermic method." The following case exhibits the good effects of the plan :—A little girl, æt. 7, was attacked by acute meningitis. Constipation had existed for 15 days, and the stomach rejected all medicine. Enemata could not be exhibited on account of the extreme aversion which the child showed to their administration. Two blisters had been applied to the thighs when M. Salques was called in, which he ordered to be sprinkled with powdered colocynth. Three hours afterward the bowels were copiously relieved, and the cerebral symptoms vanished.

" M. M., æt. 76, was the subject of an apoplectic seisure. Seventeen days elapsed without relief, and the stomach rejected all medicine. Colocynth was, therefore, sprinkled on a blister behind the neck, and with the speedy effect of overcoming the constipation."

" M. D., æt. 82, had a slight apoplectic attack in January 1844. Constipation became habitual, and after an accident caused by a fall resisted calomel and even croton oil. Hiccup and distension of the abdomen had supervened, when a blistered surface was sprinkled with colocynth. In five hours a prodigious quantity of fæces was passed."

From the analysis of these and similar cases the author draws the following deductions :—

1. There is a considerable number of cases in which the endermic method of purgation will be found highly advantageous.

2. Colocynth is peculiarly suited to endermic application; the same good results do not follow the use of aloes.

3. If the application does not cause the action of the bowels, it should not be persisted in, as it is liable to irritate and inflame the bowels as much as if taken in the usual way.

Revue Médicale de Dijon, 1844.

ART. 49.—*Treatment of Tænia by Pomegranate Bark.* Dr. MERCK states that this substance, when properly administered, never fails in effecting the dislodgement of the worm. He observes, that whenever a patient has evacuated portions of tænia, he must, if this method of cure be decided upon, take on the same, or the next day, a decoction of 20 oz. of the fresh bark of the pomegranate *root*, in lb.iss of water, reduced to lb.j. This quantity is to be taken in three doses, allowing half an hour to elapse between each dose. The worm will constantly be expelled in 24 hours at the utmost, and no relapse need be feared. The want of success is owing to the fact, either that the dry bark is used, or that it is not genuine. It will also be liable to failure if the dose is taken too great a time after the portions of tænia have been expelled, or if the dose is too feeble. No purgatives are necessary.

Revue Médicale, Med. Times, Jan. 11, 1845.

ART. 50.—*A new Vermifuge.* The tapeworm, and particularly the tænia solium, is endemic in many parts of Abyssinia; so much so, indeed, that few natives are exempt from the attacks of the parasite. Fortunately, however, the country which is so pre-eminently the seat of this disease, possesses a most efficient remedy in the flowers of the kosso, which tree being so indispensable to the health of the people, is carefully preserved. The natives are in the habit of taking this valuable anthelmintic every two months, children commencing it at the age of five or six years, and continuing it for the rest of their lives. Being a most violent drastic purge, it cannot be thus indiscriminately taken with impunity, and prolapsus ani is therefore a common affliction in that country.

The kosso (*Hagenia Abyssinica,*) when mature, attains the growth of a moderate sized tree. The medicinal part is the flowers, which are carefully dried and separated from stalks, and then pounded fine. The dose varies from six to eight drachms, and is taken in cold water early in the morning. It usually acts in the course of a couple of hours, the worm being generally expelled in the third or fourth evacuation.

Should this plant be considered worthy to be introduced into European practice, a supply could be readily obtained at Massowah, on the Red Sea. Being of a hardy character, the plant might also be successfully cultivated in Europe.

Transact. of the Med. and Phys. Society of Bombay, and *Dublin Journal,* March 1845.

ART. 51.—*Forms of Disease in which Opiates are indicated.* Dr. Sobernheim furnishes us with the summary of the diseases in which opium is beneficial, and the form of its exhibition:

1. *Fevers.* (a) *Intermittent,* when offering a nervous character (strong shivering, great anguish, unusual excitement, followed by exhaustion, giddiness, heaviness of the head, hallucinations and alienation of the senses, spasmodic and convulsive symptoms; pulse small, frequent, and irregular, skin cool, cold extremities, violent vomiting and purging). In such cases, it is either administered in large doses (from 1 to 3 grains) shortly before the paroxysm, or a little after the shivering has commenced (4 to 6 drops of tincture every hour, with chamomile-tea), or in the intermission (a quarter of a grain of opium with two grains of quinine every three hours); if the disease be combined with apoplectic phenomena, venesection is to precede it; if with gastric symptoms, an emetic. Graefe and Luders recommend opium (a quarter of a grain) with quinine (2 grains) against the dangerous shivering, subsequent to deep traumatic lesions, undoubtedly caused by the reflex action of the spinal marrow. Malgaigne also uses opium with the greatest success, after serious operations, to prevent fatal traumatic inflammations. He administers from 6 to 10 grains of opium during the day, and continues it as long as inflammation is to be feared. By this method he asserts to have prevented fever, local inflammation, and even pain. (b) *Typhus fever,* with great excitability (exhausting discharges, great excitement and sensitiveness, loquacious delirium, continual sleeplessness, pulse small, spasmodically contracted, skin dry, extremities cold), in small, repeated doses, in the form of *Dover's powder,* with *ammon. carbon. pyro-oleos.,* to encourage the crisis of the skin, but with great caution. In those forms of *typhus abdominalis,* which are combined with inflammation and ulceration of the intestinal mucous membrane, it is to be employed, according to Lesser (most advantageously in the form of clyster),

when the alvine evacuations cause great exhaustion, and appear peculiarly discoloured.

2. *Inflammations*, particularly of membranous, glandular, and sensitive organs, assuming a lymphatic character in the second stage, when the inflammatory symptoms are already removed, combined with calomel; (a) against *hepatitis*, with icterus, after venesection; against *gastritis venenata*, in the form of emulsion, to counteract the violent vomiting; against inflammation of the bladder (*cystitis*), with calomel, and under the form of clyster (P. Frank, Richter); also against *pneumonia*, when, after antiphlogistic treatment, a state of irritation is left behind, characterized by great excitement, transient, lancinating pains, dry, teazing, spasmodic cough, small, accelerated, and spasmodic pulse, cool skin, &c. In such cases, opium (from a quarter to half a grain), with small doses of ipecacuanha and camphor (and with calomel, if the inflammation be not yet quite removed), rendered the most eminent services, according to P. Frank, G. A. Richter, S. G. Vogel, and Hufeland; this particularly refers to *rheumatic* pneumonia and pleuritis. Also against *pneumonia notha* (false inflammation of the lungs), which is based on a spasmodic affection of the pneumo-gastric nerve, and on a profuse gathering of mucus in the bronchial vessels (with camphor, ipecacuanha, sulphur auratum, benzoic acid, and senega). (b) *Feverish exanthemata*, attended by exhaustion, dryness of the skin, if the eruption does not properly come out, or if it seems inclined to recede; particularly in *smallpox*, in the stage of eruption and suppuration (Sydenham, Richter, Reil, P. Frank—*non paucos ex Orci faucibus eripuit*), with musk, succinate of ammonia, angelica, camphor; against *measles*, with diarrhea, vomiting, violent cough; with great caution in *scarlatina*, on account of the frequent congestions towards the chest and head.

3. In *rheumatisms*, when without fever, and very painful, arising from suppressed perspiration; combined with ipecacuanha (Dover's powder), camphor, and preparations of antimony, it is very advantageous. Lately, opium has also been used successfully (in large doses) against rheumatisms with fever; Cazenave orders pills containing 1 grain of opium, and continues them hourly (!) till the pain ceases, or perspiration ensues. Corrigan and Hope found opium likewise very useful against acute rheumatism. The excellent effect of opium in this disease was proved in one case, where 8 venesections during 12 hours (!), emetics, sal ammonia, nitre, calomel, &c. were all employed in vain, till at last Benewitz, administered the aromatic tincture of opium (rising from ℥xx to ʒss.), with antimonial wine and nitre, and afterwards a quarter of a grain of opium with calomel, ipecacuanha, and sulphur auratum, and experienced the best results. Notwithstanding this success of opium, it is indispensable to bear in mind the following excellent sentence of Wedel: "Sacra vitae anchora est opium bené et circumspecte agentibus, cymba autem Charonis in manu imperiti et seu gladium in manu furiosi."

4. In *gout*, if the paroxysm occasions violent pains; or if it has receded towards the internal organs, opium may help to bring it back towards the skin (combined with ipecacuanha, camphor, antimony).

5. *Catarrhal* complaints, when chronic and inveterate, with teazing cough and difficult expectoration (with antimony and mercury), particularly when tending to pulmonary consumption, combined with bittersweet, liver of sulphur, &c.

6. *Morbid fluxes.* (a) In *dysentery*, with rheumatic catarrhal character,

in harvest time, with little or no fever, opium must be employed as the chief remedy, with small doses of ipecacuanha and calomel; also in the nervous forms, accompanied with exhaustion, &c. Opium is, however, injurious in inflammatory dysentery, with fever or with gastrico-bilious complication. (b) *Cholera*, in the sporadic form (from six to twelve drops of the aromatic tincture every quarter of an hour, with some acetic ether); also frictions on the gastric region, and clysters of opium; in the *epidemic* form, opium was only advantageously used against the lighter cases; whilst in the *asphyxiated* or *pulseless* modification, opium was even injurious, by the untimely stoppage of the secretions, as was shown in the late epidemic of cholera at Berlin (autumn, 1837.) (c) *Diabetes* (with animal diet); Baillie gives it with rhubarb; Berndt with ammoniuretted copper. (d) *Diarrhœa*, not caused by inflammatory action, particularly of a gastrico-rheumatic character, if very frothy, watery, and exhausting; also with great care during the period of dentition. C. Vogel recommends it against the diarrhœa, sleeplessness, emaciation, weakness, and convulsions, which generally precede softening of the stomach; Cruveilhier, against gastritic complaints, characterized by a peculiar state of the stool, resembling froth of eggs. (e) *Emesis* (vomiting), purely spasmodic and nervous (f) *Hemorrhages*, particularly of the lungs, and hæmoptysis (spitting of blood), with ipecacuanha (Jahn says, "I do not hesitate to declare opium the most indispensable remedy in this disease"); and in spasmodic uterine hemorrhages (with tincture of cinnamon, elixir of vitriol, &c.)

7. *Morbid retentions*, by spasmodic contraction of the vessels, and of the eductory canals. (a) The *icterus* of irritable, hypochondriacal individuals, after cold or mental excitement. (b) *Dropsy*, in consequence of receded eruptions, particularly anasarca and thoracic dropsy, combined with foxglove and calomel; also as an excellent corrective with squill and other violent diuretics. (c) In *painter's colic* it is the chief remedy, either by itself or with alum; sometimes with calomel, castor oil, or in a solution of sulphate of soda (Richter); here it quickly removes the spasmodic obstruction. (d) In *spasmodic and flatulent colic* (with aromatics and naphtha). (e) In *retention of urine*, when spasmodic; also used in external frictions on the region of the bladder, together with warm oil of chamomile, and in clysters.

8. In *spasms and pains*, when caused by derangement of the primary nervous functions, particularly by morbid increase of the sensitive nervous actions, and comparative inaction of the irritable system, opium restores the original equilibrium, and is thus the chief remedy. Cullen particularly advocates it in his so-called "nervous lumbago," after previous local bleeding.

9. *Neuroses*, viz.—(a) *hooping-cough*, but only in the second or nervous stage; (b) *hydrophobia*, in large doses, as a preservative, after venesection has been carried to fainting; (c) in *trismus and tetanus* it is a chief remedy, particularly when they are traumatic or rheumatic, (Stütz gave it with carbonate of potash and potash baths), in increasing doses, to begin with two grains, and increasing a quarter of a grain every hour; or twenty drops of the tincture and to rise five drops every hour, (in symptoms of poisoning black coffee is to be given along with it, and then again twenty drops of the tincture to be continued, Rust); in tetanus, proceeding from gangrena senilis, it is particularly praised by Wendt; (d) in *delirium tremens*, in large doses (from one to two grains every hour, till critical sleep appears;

if complicated with plethora of the head, hard full pulse, and suppression of the usual secretions, venesection is to precede it; if with gastric symptoms, an emetic, particularly tartrate of antimony and potash; also in *madness*, not based on organic changes, but on suppressed perspiration, sexual excitement, &c. (then to be combined with camphor); in spasmodic phenomena, fright, &c.

10. In *pulmonary phthisis*, with tormenting cough, profuse expectoration, and great sensibility; in the night perspirations opium is to be combined with acetate of lead.

11. In *gangrene*, with characters of debility, particularly in gangr. senilis and hospital gangrene, internally and externally.

12. In *syphilis*, with painful and spasmodic symptoms, (an important corrective with mercurial preparations,) particularly in nightly pains of the bones (in the form of acetate of morphia).

13. In *poisoning by caustic metallic oxides*, if, after the use of proper antidotes, a state of heightened irritability and sensibility is left in the nervous system; also against poisoning by remedies of very acrid principles (as veratrum album, helleborus, squill, colchicum, semen sabadill.)

14. *Externally*, (a) in all painful and spasmodic maladies, particularly spasmodic colic, pain through calculi (with warm chamomile oil), painful erysipelatous affections, cancers, phymosis and paraphymosis, chordee, irritable gonorrhœa leucorrhœa, and painful ulcers; (b) in some *eye complaints* it is a chief remedy, particularly in chronic ophthalmia left after the acute inflammation, when great sensibility, lachrymation, photophobia, and spasm of the eyelids remain behind; and particularly in arthritic, syphilitic, blenorrhagic and metastatic ophthalmia; against varices of the conjunctiva, obscurations of the cornea (Lallemand), ulceration, pannus, pterygium, staphyloma; it is also an excellent remedy in polypus of the nose, (the polypi are to be daily touched with laudanum, and covered with lint imbued in the same tincture), polypi of the ear and uterus; *chilblain*, frost-bitten limbs.

Art. 52.—*Tobacco—a Cause of certain Diseases.* [Mr. Shipman has called the attention of the profession to a point which is not without interest in this country, although the "noxious weed" is not here used to the same reckless excess as in America. He thus relates his experience upon the subject]:—

In the year 1837, my attention was called to two cases of disease in the same family. The symptoms and phenomena attending them were so similar, that it struck me at once that they had a common origin. The first was that of a young gentleman, D. W., a student at law, of a nervo-sanguine temperament. He had been a martyr to dyspepsia for two or three years. He had spent a year in the Western States, and had attended the law lectures at Cincinnati. While at the west he had acute ophthalmia, which was treated by active depletion with little benefit, as his eyes, when I first saw him, were highly injected; cornea vascular and semi-opaque, and the lids granular. He applied to me for the treatment of his eyes, but what most afflicted him constitutionally was low spirits, want of resolution, and general hypochondriasis. His stomach would receive food with a good relish, but the moment he had finished his meal a train of nervous symptoms came on, which harassed him for two hours, until the stomach was empty. Acidity, cardialgia, gastrodynia, palpitation of the heart, giddiness, vertigo, and fulness of the head, with the most profound gloom;

keenly alive to every feeling, he was in constant fear of death, yet tempted to commit suicide, to escape from a life more intolerable than death itself. These symptoms harassed him for months, with varying degrees of intensity, when a new symptom arose, which terrified him more than all the rest. His sleep had been broken by the most horrid imagery, in the shape of frightful dreams, for more than a year; but now, when the first hour of sleep came over him, he was suddenly awoke by a shock in the epigastrium, which started him in great alarm from his sleep. These shocks and startings were repeated several times in the course of the night, and as often as he fell into a slumber. They were at first confined to the epigastrium, but, after a few weeks, the sensation was transmitted to the head, which he described as more unendurable than when confined to the epigastrium. It was followed by a sensation as if a rush of blood took place to the head, and a firm conviction in his mind that he should die with apoplexy. This impression preyed upon his mind incessantly.

I was often summoned in the night in great haste, and found him agitated, with cold sweats, palpitation, and terrible apprehensions of immediate death. A little soothing encouragement, a dose of morphine and carbonate of ammonia, would dispel his fears and quiet his agitation, and enable him to rest the remainder of the night with tolerable composure. This state of things lasted several months, during which time he was not in a condition to pursue any kind of business, and finding that medicines only gave him temporary relief, I suggested to him that tobacco might have some agency in his complaints (as he used it freely, by smoking, chewing, and snuffing), and advised him to abandon the habit. In this I was successful, so far as chewing and snuffing were concerned; but he was so attached to his cigar, that it was a long time before he could be induced to leave that. I will here add, that from the time he left the habit of chewing and snuffing, his health in some measure improved, particularly the shocks and epigastric sinking. He now became satisfied that this partial abandonment of the habit had been productive of good, and renounced the habit entirely; and the nocturnal shocks and epigastric sinking, with the whole train of nervous affections, vanished as if by magic. His digestive powers gradually improved; the chronic inflammation of his eyes yielded readily to appropriate treatment; the gloom and despondency which had oppressed him as an incubus, cleared away; the nervous palpitations and rushings of blood to the head subsided, and he was able to prosecute his studies with energy, was admitted to the practice of the law, and is now an able and talented member of the bar, in the possession of good health, spirits, and prosperity. The foregoing history I copy from my notes taken at the time. There were many other symptoms which are common in dyspeptic cases, and many of those described are found in every-day practice in nervous dyspeptics and hysterical habits. The sudden and complete cure of all the symptoms, on leaving off the use of tobacco, was too obvious to escape the observation either of patient or physician.

I will now briefly allude to the case of a sister of the gentleman whose case I have been describing, although not occurring in the order of my notes. She was married, and the mother of two children; her age, 39; dyspeptic for the last 10 years; of a nervo-sanguine temperament; her youngest child 10 years of age. Suffered since her last accouchement from leucorrhœa, partial prolapsus uteri, and hypochondriasis. Has smoked and snuffed tobacco for the last 15 years; eight years ago began to have shocks at

the epigastrium, with a sinking sensation at the pit of the stomach, cardialgia, acid eructations, a sense of rushing of blood to the head, palpitations, sleeplessness, and startings when first falling into slumber. These kept increasing upon her, when there came on tenderness of the spine along its whole length, but more especially in the cervical and lumbar regions, rigidity of the limbs, costiveness, derangement of the catamenia, &c. She had been under treatment for a long time, with little or no benefit. To soothe her feelings, she had taken more freely of snuff, and had smoked more often, as she fancied that it gave her temporary relief. Seeing the good effect from abandoning the use of tobacco in her brother, she made the same experiment in part herself, and with the same marked relief from many of the symptoms. The shocks at the epigastrium left her, sleep became quiet, her mind more cheerful, and the epigastric sinking, cardialgia, acidity, and eructations, were greatly relieved. The spine, however, required cupping and counter-irritation, and, with the use of anodynes and tonics, she recovered a comfortable state of health. This patient has frequently ventured upon a moderate use of tobacco since, but, after using it awhile, she experiences, though in a slight degree, her old feelings, and then quickly abandons it. She is perfectly satisfied of its pernicious influence upon her constitution, and, therefore, is in little danger of carrying its use again to excess.

S. E., æt. 40, was in possession of good health until 1838, when he began to emaciate and grow pallid; his food did not digest well; with acidity, heartburn, gastralgia, palpitation of the heart, sinking at the pit of the stomach, and a host of nervous symptoms; gloom, hypochondria, and apprehensions of sudden death. But what most amazed him, and which filled his cup of misery full, was shocks at the epigastrium, which attacked him when first falling asleep every night. These followed him two years, and increased to such a degree that his sleep was a succession of starts, which nearly wore him out. At the end of two years they came upon him during the day. He described them as like shocks of electricity, and confined to the epigastrium. He was incapacitated from business of any kind, was weak, irresolute, and desponding; had consulted many physicians, and taken a great variety of medicines, with only temporary relief. On his giving me a history of his case, I was struck with its similarity to that of D. W., and inquired if he was not in the habit of using tobacco. He stated that he was, and had sometimes imagined that it might have some agency in producing some of his bad feelings, but had never had any physician advise him to leave it off, and, in reality, was too much a slave to its use to lightly make the sacrifice. Upon my assuring him that the symptoms and disease depended upon the habit, and that nothing but a complete and total abstinence from it would restore him, I extorted a promise that he would lay it aside a month at least. As he was costive, I prescribed the compound syrup of rhubarb, and directed him to call again in a month. At the end of that time I was agreeably surprised to witness the improvement in the appearance of my patient. His countenance, which had previously exhibited a sallow, pallid aspect, was now ruddy with health and strength; he had gained fifteen pounds of flesh in the time, and his strength had increased daily from the time I last saw him. But what to him was more than all the rest, the annoying shocks, with the general nervous agitation attending, had entirely left him from the third day of his abstinence from tobacco. The dyspeptic affection, the palpitation, the gloom and depression of spirits, the apprehensions of death, had

vanished as if by enchantment. He had resumed his business (that of a farmer); he could now sleep quietly through the night, and get up in the morning refreshed and buoyant in spirits, and is so convinced that tobacco was the root of all his previous complaints, that it requires no advice to induce him to for ever refrain from its use. This man has now the most perfect health, and has taken no medicine since the first month.

C. P., æt. 43; nervo-bilious temperament; farmer; temperate; has been a tobacco chewer for 20 years; has been dyspeptic the same period, more or less, attended with nervous palpitation and acidity, hypochondriasis and epigastric sinking. First began to have shocks at the epigastrium in 1839, in the night, on first getting asleep, which started him up in great agitation and alarm; was frequently obliged to get up and sit, for fear of the shocks. On his consulting me, I advised him to discontinue the use of tobacco, and prescribed no medicine. He left it off and the shocks immediately subsided. He did not resume the use of tobacco again for 18 months, and was healthy during the time. Being of an irresolute disposition, he resumed its use again, and in two months the shocks began with great severity. They were now felt in the chest and region of the heart, at first always in the night, but after awhile in the day-time, with a rushing of blood to the head, which would momentarily deprive him of consciousness. The shocks now took place in the head. This so terrified him that he earnestly besought me to prescribe something for him, and agreed to abide by my advice. My opinion was, that no medicine would be of the least service without a complete abandonment of tobacco. This he solemnly pronounced he would do. I prescribed the compound syrup of rhubarb, with the ammoniated tincture of valerian. The shocks at once left him, his sleep became quiet, his dyspeptic symptoms disappeared, his mind became calm, spirits elastic, and he was capable of working his farm. Two or three times since he has cautiously ventured on the use of tobacco, but, after a certain length of time, his old feelings begin to appear; so that it is reduced to a demonstration that tobacco was the sole cause of his former troubles. This man has increased 15 pounds in flesh, and his colour, from being sallow and pale, is of a ruddy hue.

S. C., æt. 63, farmer; robust and healthy, until four years ago, when he began to complain of epigastric sinking, sleeplessness, palpitation, irritability, and nervous tremors. Shocks at the epigastrium came on at the first hour of slumber, which were repeated several times in the course of the night, and often in the morning before breakfast. Has been a tobacco chewer thirty years, and a portion of the time, to great excess. On his consulting me, I suggested that tobacco was the agent in all the trouble which he experienced. He said he had often suspected it, but had never had fortitude and resolution to forego its use, but agreed to make trial. The shocks immediately left him, together with all the train of nervous affections; his sleep became calm, his strength and flesh returned, his spirits improved, and he has gained twenty pounds of flesh in three months. He has not resumed the use of tobacco. This man was temperate in all things except tobacco, neither using tea nor coffee. He was sensible for years that something was wrong, but could not believe that an article in such universal use as tobacco, and one which he had used for a long series of years, could possibly cause his troubles. This, I am persuaded, is the case with hundreds who are similarly situated.

S. J., æt. 54; nervous temperament; farmer by occupation; has been in the habit of using tobacco for ten years. It frequently has salivated him.

He spits much, is emaciated, nervous, and hypochondriacal. The shocks commenced about two years ago, in his bowels. They came on in the night, when first getting into a drowse; at length they came on in the day-time, with epigastric sinking, costiveness, and dyspepsia. I put him on the use of the compound syrup of rhubarb and ammoniated tincture of valerian, and, at the same time, he left off the use of tobacco. The shocks immediately left him, and he improved gradually, so that at the present time he is in comfortable health.

A. C., æt. 27; is of a sanguine temperament, and robust habit; a farmer by occupation. Has chewed tobacco for four years to excess; was taken, in the summer of 1841, suddenly, with sinking at pit of stomach, and faintness, which obliged him to lie down in the field. Shocks at the epigastrium came on about the same time. These were first at night, on getting asleep, but after awhile in the day-time; at these times he would suddenly break out into a profuse perspiration. His digestion was tolerably good, and his health otherwise little impaired. He says that, previous to these symptoms, he had used large quantities of tobacco, but never imagined that it could hurt him. I advised him to immediately discontinue its use, which he did, and the shocks and faintings left him at once, and have never returned. This man took no medicine.

Rev. Mr. H., æt. 30; of a nervo-sanguine temperament; addicted to the use of tobacco fifteen years. For many years he was troubled with epigastric sinking, and lately with shocks in the same region. He is in tolerable health in other respects, and, but for the annoyance which they occasion him when first getting asleep, would not think of asking medical advice. I recommended him to quit his tobacco, which he did, and a perfect cure was the result.

J. S., æt. 40; of a nervo-bilious temperament; followed the sea many years; commenced smoking for spitting up his food: soon commenced chewing, and carried it to excess, often using a pound a week. Five years ago, began to feel a sinking sensation at the pit of the stomach; then starting from his early slumbers, with a shock through the epigastrium, and sometimes chest; a rising sensation, like an aura, to his head; oppression at the chest great, and sudden difficulty of breathing, palpitation, choking, sudden faintings, unquiet sleep, frightful dreams, dyspepsia, and hypochondriasis. From being strong, robust, and resolute, he became weak, nervous, and timid. In this condition he applied to me for advice. It was with great difficulty that I could persuade him to quit his tobacco, and, when he attempted it, was often a backslider. But soon he perceived the good effects, and was at length induced to lay it entirely aside, and with it went all his former bad symptoms. I have since ascertained that he was somewhat addicted to the use of ardent spirits, which may have contributed in a measure to some of the complaints.

Remarks. I might multiply cases, that have fallen under my observation, to demonstrate the fact that tobacco is capable, in certain constitutions, and under certain circumstances, of producing a specific set of phenomena, which are peculiar and pathognomonic. All the symptoms are more or less attendant on dyspepsia, hysteria, and hypochondriasis. But the shocks at the epigastrium are so prominent a symptom, and so uniformly left when tobacco was abandoned, as to constitute a striking peculiarity. The habitual use of any narcotic is liable to produce derangement of the digestive organs, and, through that, a long train of nervous derangements, which baffle the skill and tire the patience of the physician. The digestion once

impaired, the great nervous or ganglionic system takes on a chain of sympathies, which are often at a distance from the first organ affected.

The habitual use of tobacco, when not carried to excess, does not always produce disease, and perhaps we may say that it does not generally do so. From the nature of the substance, and its peculiar narcotic properties, an individual cannot start off at once on a free and liberal use of it. Nature has so fashioned us, that when we transgress her bounds (especially in reference to tobacco), we are reminded, by nausea, of the extent we are allowed to go. If it were not for this, how many would destroy themselves before a habit could be formed, rendering its employment so safe that large quantities can be taken almost with impunity. It is the same with all narcotics. Opium, for instance, can be taken, if a habit is once established, in immense quantities, and apparently with little harm. Still, there are constitutions that have long held on under the use of narcotics, that will receive gradually, and almost imperceptibly, an injury which nothing can remedy, so long as the pernicious habit is persisted in. This is emphatically true as regards the use of tobacco. The martyrs themselves little suspect the secret enemy that is sapping the foundations of health and life. They have been accustomed to it, perhaps, from childhood. Their grandfather, father, and brothers, have used it before them. They never heard a word spoken in disparagement of it, and their own inclination is a powerful advocate for the pernicious article. Perhaps, too, their physician has spoken a good word in favour of their common friend, which has done much to establish it still stronger in their good graces. They may, however, now and then have some misgivings, as they lay awake night after night, taking an inventory of their wretched feelings; but this is laid to the charge of dyspepsia, or the wear and tear of business, until finally they ascertain the true cause, or some acute malady comes to their relief, which, while it lasts, compels them to abandon (for a while, at least) the article, while nature re-asserts her violated laws.

As a general rule, those who use tobacco to excess are much troubled with wakefulness; and when they do sleep, it is not "tired nature's sweet restorer," but a succession of broken slumbers, interrupted by startings and disagreeable dreams. Excessive smoking has been known to produce a state of the system in all respects similar to delirium tremens. Most of the narcotics, I believe, when habitually indulged in, render sleep broken and disturbed with dreams of frightful imagery.

I am not disposed to condemn the use of tobacco in toto, for I am not certain that in many constitutions and temperaments it may not be of some service, or at least, that it may not be free from harm; but in those of a nervous temperament, predisposed to dyspepsia and hypochondriasis, I am certain that it is capable of, and generally does do, a vast deal of harm, and is productive of an amount of bodily and mental suffering, which few men are willing to encounter a second time. Every physician of much experience in chronic disease, cannot fail of seeing, in some of the cases which I have attempted to sketch, a portrait of many a wretched patient, who has, with eloquence and painful minuteness, dwelt on his sufferings, his fears, and his fancies. Such cases have generally been called dyspepsia, and have been drugged and dieted, or sent off on foreign travel, carrying in their waistcoat pocket the Pandora's box of all their woes.

Boston Medical and Surgical Journal, and *Medical Times*.

ART. 53.—*Chromic Acid in Hemorrhoids.* [Mr. Ure relates the following case in proof of the efficacy of chromic acid in ulcerated piles. He explains its action, upon the principle that it readily yields oxygen to organic substances, being reduced to the state of sesquioxide. It is very convenient for application, as it consists of a thick crystalline pap; the escharotic action of which, when properly applied, does not extend beyond the prescribed limits] :—

S. L., æt. 31, tailor. At the verge of the anus is a dark hemorrhoidal tumour, the size of half a walnut, ulcerated, and extremely painful. The tumour had been protruded several days, and had resisted various attempts at reduction. The patient was greatly reduced by continual suffering, from which he could only obtain a respite by preserving the bent posture. The bowels were open. The chromic acid was freely applied to the ulceration, on the 27th of April; on the 29th, a considerable slough had separated, and the tumour had considerably shrunk in dimension. Some pain was felt for a few hours after the application of the acid, but he was completely cured by May 13th.

A second case is related, which was equally successful.

Medical Gazette, March 21, 1845, p. 787.

ART. 54.—*Terchloride of Gold in Rheumatic and Gouty Affections.* This substance made into an ointment with lard, has been found to relieve rheumatic and gouty pains with great certainty. It tinges the skin purple, but this stain is readily removed by ablution with urine.

Medicinische Zeitung, No. 11, 1844.

ART. 55.—*On the Employment of the Extract of green Walnut Shells in chronic enlargement of the Tonsils.*—A little boy, who had long been the subject of this troublesome affection, was brought to Dr. Becker, of Munhausen (Prussia), for advice. He was recommended to use the following prescription as a lotion externally, and as a local application to the tonsils:

℞ Extract of walnut shells, 4 grammes.
Warm water, 64 grammes.
Mix and dissolve.

Gazette des Hopitaux, Feb. 13, 1845.

ART. 56.—*Formula for Sarsaparilla Broth.*—Recommended by Dr. Egan, in phagedenic ulceration:

℞. Decoct. sarsæ comp., Oiss.
Carnis bovini, lb. ss.
Coque simul super lente igne ad dimidium, et sumatur quotidie.

Dublin Med. Journal, Jan. 1845.

ART. 57.—*Formula for the Peroxide of Iron, an Antidote for Arsenic.*

Sulphate of iron, 1000 parts.
Sulphuric acid (sp. gr. 1·847), 200 parts.
Water, 4000 parts.
Nitric acid, q. s.

Dissolve the sulphate of iron in the water, add the sulphuric acid, and boil; then add the nitric acid until all effervescence ceases, and red fumes are no longer emitted; let the mixture cool, and add twenty or thirty times

its weight of water; then precipitate the iron by adding ammonia in excess; wash the precipitate till it ceases to render aqua baryta turbid, and preserve it in a gelatinous state.

Medical Times, Pharmaceutical No. for March.

Art. 58.—*Tincture for the Treatment of Alopecia.*—Dr. Landerer speaks highly of the following prescription for the restoration of the hair:—Leaves of the cherry laurel, 60 grammes; cloves, 8 grammes; tincture of lavender, 180 grammes. Digest for six days, filter, and add 15 grammes of sulphuric acid. The bottle should be kept hermetically sealed. The bald parts are to be rubbed daily. The effect is perceptible in six or seven applications.

Zeitschrift fur die Gezammte Medicin.

Art. 59.—*New Cement for the Teeth.*—M. Ostermayer proposes a cement which he considers to approach very nearly to the composition of enamel: it consists of quicklime, 13 parts; anhydrous phosphoric acid, 12 parts. The lime must be finely pulverized, and chemically pure. The anhydrous phosphoric acid is obtained by the combustion of phosphorus in dry air. The two substances are to be quickly mixed together, so as to form a powder. This is to be introduced into the cavity of the tooth, previously dried, and to be moistened with a small quantity of water.

Encyclographie des Sciences Médicales, Jan. 1845, p. 37.

PART II.

SURGERY.

SECT. I. SYMPTOMATOLOGY AND DIAGNOSIS OF SURGICAL DISEASES.

Art. 60.—*On the Diagnosis of Aneurism.* By Professor Miller.*

The diagnosis of aneurism is one of the most important points in practical surgery. The following considerations will generally enable us to escape from error. Chronic abscess, and glandular or other tumours, are the morbid states most apt to assume the aneurismal characters. They often, especially the latter, simulate the disease very closely, strong and distinct pulsation being communicated by a neighbouring artery of large size. But:—

1. Aneurism is soft and compressible from the first, and then becomes hard by the solidification of its contents. An abscess may be soft from the first, but more frequently begins with induration, and softens secondarily, reversing the progress of aneurism. A small chronic scrofulous abscess may be soft from the first, and seem to be compressible, when situated for example in the groin, axilla, or root of the neck, it may seem to disappear by pressure beneath the surrounding hardness, but on removing the pressure, the lively resiliency of the aneurism is wanting. An enlarged gland or other tumour is invariable, first hard, then soft, and never capable of being dispersed by pressure, and unless suppuration occurs, softening and fluctuation do not supervene at all.

2. Pulsation is equable in aneurism. At every point the pulsation is equally distinct; whether the tumour be compressed directly downwards, or laterally, the pulsation is the same. A swelling not aneurismal, laid over the back of an artery, and receiving impulse from it, has a very distinct pulsation when the first mode of pressure is employed, but when raised and held by the sides, the pulsation will be found to be either very faint or altogether absent.

3. Pulsation of aneurism is felt from the first. Not so in the case of tumours not aneurismal. At first they are small, and not encroaching upon the vessel, they receive no impulse; only after a time do they enlarge to such an extent, as to lie in close contact with the artery, and receive its pulsation.

4. Aneurism has expansion coincident with pulsation. The fingers placed firmly on the tumour, diminish it more or less; the pulsation is felt increasing in proportion to the pressure employed, and at each impulse

* Principles of Surgery, by James Miller, Esq., F.R.S. p. 439.

there is a palpable elevation of the hand, by expansion of the walls of the cyst. A swelling not aneurismal, on the contrary, may have its apparent impulse augmented by increase of pressure; but it can never have expansion of its entire bulk at every point; it is simply raised, and whether in systole or diastole, its dimensions are unaltered.

5. An aneurism ordinarily yields both thrill and bruit to touch and auscultation. Another tumour may possess the latter, but has not both conjoined.

6. Pressure on the cardiac aspect of the aneurism diminishes its pulsation, bulk, and thrill; pressure on the distal aspect has precisely the contrary effect. Another tumour may have its apparent pulsation similarily affected, but its pulsation only.

7. Change of relative position affects the aneurism but little; it is not so with other tumours.

8. Perhaps the tissues are lax enough to permit of the vessel's course being traced by the fingers. If the tumours be aneurismal, it will be impossible to detach it from the artery, if non-aneurismal, the vessel will be found at all times perfectly free.

Art. 61.—*On the Diagnosis of Fracture.* By Mr. Grantham.*

Although the following method is by no means new to the English surgeon, it is at present but seldom adopted. "The stethoscope applied over the place of fracture, in the slightest motion of the part, conveys a much more decided crepitus than is perceived by the naked ear during the most extended movements of the part. In many cases, even the slight pressure of the ear on the stethoscope, suffices to produce the crepitation, a circumstance of no small importance, as freeing the patient from the pain necessarily excited by the motion requisite in the manual examinations. The crepitus yielded by the more solid bones is sonorous, and resembles the sound produced by breaking a piece of wood across the knee; it is accompanied with a sensation of roughness unpleasant to the ear. The sound yielded by the more spongy bones is duller, and resembles the effect of a rasp on wood; except that now and then this noise is broken by sounds of a clearer kind, like those afforded by the compacter bones, only not so loud. The sound from oblique fractures is stronger than from those which are transverse; but when one end of the fractured bone rides over the other, the sound is then obscured, and, in some cases, may not be perceived without slight extension or counter-extension of the limb. If the fracture is comminuted, the sensation, as of distinct portions of the bone, is conveyed by the stethoscope. When fluids are effused around the fracture, a gurgling is combined with the crepitation, and which is compared to the sound produced by a shoeful of water." (Lisfranc). A dry crepitus rattle is produced by inflammation of the cellular structure, wherein the serum becomes suppressed, and the cells distended with air, which may be mistaken for the crepitus arising from fracture. It is much louder, and may be distinctly heard by the patient or bystander; it is heard by making gentle pressure with the fingers, or end of the stethoscope, over the injured part; it is most distinct on the third day, and decreases on the fifth; it is a sound apt to be mistaken for fracture of the fibula. We have a sound like this in the common subcutaneous emphysema, on pressing uninterruptedly with the hand on the affected part.

* Facts and Observations on Medicine and Surgery. London, 1845. p. 61.

Art. 62.—*Diagnosis between Coxalgia and Neuralgia.* M. Piorry recommends percussion of the great trochanter, as a means of diagnosis between neuralgic pain of the hip and coxalgia. If this manœuvre increase the pain, the case is one of the latter disease. He finds this method more significant than pressure from the sole of the foot.

Gazette des Hôpitaux, April 10, 1845.

Art. 63.—*Dissection of a Partial Dislocation of the Shoulder upwards.*

By Alfred Smee, Esq., Surgeon to the Royal General Dispensary, &c.

(*Lancet,* March 22, 1845.)

The numerous accidents to which the human frame is of necessity liable in a country where every kind of machinery abounds, and where force is continually applied to the body in every possible direction, affords us opportunities of observing, not only the natural processes of restoration, but also enable us to draw conclusions on the physiology of various parts of the body.

2. An interesting instance of this character has lately occurred at the Aldersgate School of Medicine; for on the dissection of a body, the opportunity of examining the rare dislocation of the shoulder upwards was afforded. The student, Mr. Lloyd, who had charge of the arm, discovered, after he had removed the deltoid and made a slight incision into the cellular tissue, underneath, a very remarkable appearance, to which he at once requested my attention. Upon a careful examination, we found that the upper part of the great tubercle of the humerus, instead of being used for the attachment of the muscles, was converted into an articular surface, around which the cellular tissue was a little thickened, to form a sort of feeble capsular ligament. This surface corresponded to another smooth surface formed on the acromion, partly on the under surface of the acromion itself, and partly by new bony matter, extending from one eighth to half an inch into the tendon of the deltoid. Although these two articular surfaces were not so even as the normal articular surfaces of a joint, yet they were smooth, and glided on each other without any catching or sensation of asperity.

3. If the great tubercle was converted into an articular surface, the parts usually attached to it must have been removed, and accordingly we found, on examination, that the tendons of the supra-spinatus, infra-spinatus, together with the capsular ligament, were torn from the tubercle; and a piece of bone still left attached to the ruptured margin of the tendons indicated that the tubercle itself had suffered more or less injury from the accident. The parts thus forcibly detached left a gap, through which the cavities of the normal and abnormal joints mutually communicated. The concentric edge of the ruptured parts was perfectly smooth, and lined with a kind of synovial membrane below and above. The piece of the great tubercle inclosed with the tendons was rounded, and consequently presented no impediment to free motion in every direction.

4. The head of the humerus with its articular surface was perfectly healthy, and the glenoid cavity was also perfect. The head glided freely in the glenoid cavity, and the capsular ligament at the lower part was entire. The subscapular muscle was inserted, as usual, into the lesser tuberosity, the teres minor into the inferior portion of the great tubercle, and the tendon of the biceps was attached to the neck of the scapula.

5. Besides however the spinati, or two superior capsular muscles, the

long head of the biceps must be considered as a muscle destined to regulate the motions of the joint in a proper direction, and that tendon was found ruptured, as well as those of the former muscles. In the process of separation, the ruptured end had adhered firmly to the biceptal groove, and consequently had lost all immediate influence on the joint itself.

6. From the above dissection, we are in a condition to infer the probable nature of the accident at the time of its occurrence, and it is apparent that the tendons of the spinati and the capsular ligament were torn from the great tuberosity, and the tendon of the biceps ruptured. The general effect of the accident was to produce an opening into the joint under the deltoid We have not the slightest ground for supposing, from this dissection, that any other injury occurred to the joint besides that which we now find. That some other injury might have occurred is far from impossible; but we wish clearly and emphatically to point out that no evidence of such accident was indicated.

7. Such, then, was the probable nature of the accident at the time of its occurrence; but we must now study the effects which were produced in the process of restoration. We find that nature was unable to fill up the gap produced by the laceration of the capsule, and that the attachment of the muscles to the great tubercle was not restored. The edge of the lacerated ligament and tendons was rounded, presenting a crescentic margin, the concavity of which was turned to the great tubercle, and the two horns firmly joined to the bone. The aperture therefore existing between the two joints was bounded by this semilunar fold internally, and the great tubercle externally. In the process of separation, several strong tendinous bands were formed in connexion with this semilunar fold, which acted as accessories to strengthen the capsular ligament, which remained entire. These bands, however, were closely combined with the capsular ligament, and did not in any way interfere with the free movements of the joint. I have before mentioned that the tendon of the biceps was united to the biceptal groove.

8. Such were the only changes indicated in the joint itself, and it is a remarkable and important fact that it should not have suffered any injury in structure, in fact, no change of texture, from its attempt to repair an injury caused by the terrible violence to which it must have been of necessity exposed.

9. The effect of this accident, however, was to destroy part of the curious mechanism by which the head of the humerus is compelled to play in the glenoid cavity; and the result exhibited in this case showed, most incontrovertibly, the influence of the spinati and tendon of the biceps on the position of the joint. Upon the division of these muscles, there was nothing to prevent the humerus from rising to the acromion under the action of the deltoid, and it rose accordingly to that position. The great tubercle on every movement of the arm pressed against the acromion, and in that way a new joint was formed between these two parts, a little cellular tissue being thrown around to form a capsule.

10. Regarding the total alterations in the joint, arising from the injury, as a whole, we find that the shoulder-joint was converted into a double joint, one joint existing between the head of the bone and the glenoid cavity, the other between the great tuberosity and the under surface of the acromion. Inasmuch as the head of the humerus was moved from its place it must be regarded as a dislocation; but as the removal of the head from the glenoid cavity was incomplete, we must term it a partial dislocation of the humerus upwards.

11. The two joints cannot be regarded as having opposite properties, for in reality, if carefully examined, we find that the bone glides in the two articular surfaces at one time. Their general effect combined, is to render, not only the surface of the socket, but also that of the ball of this ball-and-socket joint more extensive, and thus this injured shoulder was converted into a joint possessing more of the characters of the hip-joint than usual; in fact, if this new joint had been continued to the glenoid cavity behind, and extended laterally, it would have formed a perfect socket. It was not, however, so extensively changed, and but a small piece of the socket alone was added. A very important object is fulfilled by the socket of the shoulder-joint being of so small an extent, for in that condition it can admit of a much greater variety of delicate motions. The addition of another portion to that socket, doubtless, more or less partially interfered with the functions of the joint, though, from the post-mortem appearances, we are hardly in a condition to ascertain the extent of deviation from the natural standard.

12. This, unquestionably, must be regarded as an extremely rare accident, and must have been the result of considerable force applied in a peculiar manner. There is only one point in the case which can at all throw light on this part of the investigation, and that is, the presence of a fracture of the clavicle, on the same side which had united. We are unable to ascertain whether the fracture took place simultaneously with the other injury; but, supposing it to have occurred at the same time, we should be justified in inferring that this accident was not complicated, at the time of its occurrence, with any of the ordinary forms of dislocation, because the fracture would have seriously interfered with its reduction.

13. There is, as far as I know, but one other dislocation of the shoulder upwards, the dissection of which is recorded. This preparation is preserved in King's College Museum, and the account, by Mr. Soden, is published in the *Medical and Chirurgical Transactions*. In this case, the accident differs materially from that which I have just described, inasmuch as the only accident to the joint was a dislocation of the tendon of the biceps, which allowed the head of the bone to be drawn to the acromion. Taking these two cases together, we obtain the following physiological conclusions:—first, that the tendon of the biceps is sufficient alone to keep the head of the bone from rising from its situation, or, at any rate, contributes principally to that object. Secondly, that the supra and infra spinati have no influence in driving the head of the humerus under the acromion, inasmuch as it was drawn in that situation when these muscles were divided.

14. Supposing such an accident should again occur, we might inquire what probably would be the symptoms from which we might derive our diagnosis. In the first place, there must be a slight shortening of the limb, and its axis would also be slightly altered. When the arm was drawn close to the side, the head of the bone would be more prominent than usual under the deltoid muscle. The tubercle would probably grate against the acromion, in abduction.

15. I do not see how this dislocation could be confounded with any of the more usual forms, though we might anticipate that, inasmuch as the indications not being very prominent, it might possibly escape the attention of the surgeon altogether.

16. If the surgeon had clearly satisfied himself that this accident existed, what treatment ought he to pursue? Pathology indicates relaxation of the deltoid, relaxation of the supra and infra spinati, and relaxation of the long head

of the biceps. We can effect all these objects by throwing the arm of the affected side behind the head, so that the fingers touch the opposite shoulder. It might be kept in that position by a bandage fastened to the wrist of the affected side, and carried round the axilla of the opposite shoulder. In the application of the bandage, we must remember that the entire weight of the arm will be supported by it, and on this account it would be necessary to pad the axilla, and to be careful that the weight does not injure the wrist. The use of these very simple means for two or three weeks would probably cause the gap to be very small. Perhaps such a treatment might be adopted with rupture of the tendon of the biceps or the spinati; for to bandage the arm to the side, in these cases, would widen the gap, and cause mischief.

17. This line of treatment would not be applicable when the accident is complicated with fracture of the clavicle, as it would tend to increase the tendency of the end of the bone to overlap. Probably the rarity of the accident depends upon the expenditure of force by the fracture of the clavicle, which is more easily effected than the rupture of the tendons.

18. For the sake of information, I have examined the account given by Sir Astley Cooper, of such cases of dissection of dislocations of the shoulder-joint which have either come under his own observation, or which he has collected from the labours of others. He describes two dislocations into the axilla, in both of which the subscapular is torn, and in one the tendons of the spinati and teres are more or less lacerated. The case before us differs from both those recorded by Sir Astley Cooper, in having the subscapular entire, and from one, in not having the teres injured, but in having the spinati completely instead of partially ruptured.

19. In one dissection of a dislocation, the tendons were all perfect, and in another, the spinati and subscapularis were completely detached from their tubercles. Our present case differs in having the subscapular entire, from that in which tendons were ruptured.

20. But one account is given of a dislocation backwards, and in that case the subscapular was torn.

21. One case is narrated of a dissection of a partial dislocation under the coracoid process, where all these muscles were entire.

22. In all those four cases recorded by Sir Astley Cooper, in which rupture of the tendons occurred, the subscapular partook of the injury, but in the case before us the subscapular remained uninjured. From this remarkable peculiarity, I think that the opinion is strengthened, that force was applied in a manner differing from that required to produce the other and more ordinary forms of dislocation.

23. There is no similar preparation in the Royal College of Surgeons of England, and with the exception of Mr. Soden's, in King's College, London, which differs materially from it, as far as I know, it has no precedent. The partial dislocation upwards of the shoulder-joint, of itself, is sufficiently rare to demand its publication, but inasmuch as this rarity is rendered still more uncommon by being accompanied by a false joint between the great tubercle and acromion, it becomes still more deserving of being recorded as one of the accidents to which this part of the human frame is liable.

[A similar lesion is described by Mr. Potter, as occurring to him in the dissecting-room of University College. As will be seen, he differs somewhat from the opinions of Mr. Smee. In this example]:—

"The capsular ligament was extensively ruptured on the outer aspect of the joint, between the tendons of the sub-scapularis and supra-spinatus

muscles. The opening, large enough to allow the head of the humerus to pass readily through it, communicated with a large bursa, which lined the under surface of the acromion, forming a species of false joint between that process of bone and the upper and outer part of the head of the humerus. The long tendon of the biceps was torn through, near its origin, from the margin of the glenoid cavity; it appeared to have retracted, and was closely united to the bicipital groove by means of slender semi-transparent shreds, attached somewhat after the manner in which the columnæ carneæ are attached to the walls of the heart. The tendons of the supra-spinatus and infra-spinatus muscles were stripped completely from their natural insertion into the upper part of the great tuberosity of the humerus, but retained their connexion with the teres minor, through the medium of which they were indirectly attached to the neck of the bone. The supra-spinatus muscle was pale and atrophied, and forced to pass in a curved direction round the head of the humerus, leaving its upper part bare and rough. No ulceration appeared on the surface of the cartilage, though its margins were fringed with numerous little fleshy projections, as if lymph had been deposited there, and organized, during the process of repairing the injury, in the capsular ligament.

From these appearances, I concluded that the primary injury had, in all probability, been a dislocation of the head of the humerus forwards and upwards; and should the subject be deemed one of sufficient interest, I may perhaps be allowed to add a few remarks on the kind of evidence that induces me to offer this as a probable explanation of the accident in both cases.

The circumstances which determine Mr. Smee in concluding that the primary dislocation was directly upwards, appear to be:—

1st. The situation of the rent in the capsular ligament.

2d. The actual position of the head of the humerus.

3d. The formation of a false position between the head of that bone and the under surface of the acromion.

But are such conditions peculiar to, or distinctive of, this form of dislocation?

1. The situation of the rent in the capsular ligament would seem to allow most easily of an ascent of the humerus towards the acromion, in the vertical position of the arm; but it would as readily permit the head of the bone to pass forwards and upwards, provided the axis of the shaft of the humerus happened to be in that direction at the moment when a displacing force was applied to the point of the elbow. Under such circumstances, the tendon of the sub-scapularis, if sufficiently strong to resist the rending force, would turn the head of the bone slightly upwards, at the same time drawing the outer part of the capsule somewhat forwards, the effect of which would of a necessity be a tendency to rupture of the capsule between the tendons of the sub-scapularis and the supra-spinatus; in fact, at the point at which the actual rent was found in the dissections before us. As a case in point, I may refer to a dissection of a recent dislocation of the shoulder forwards, related by Sir Philip Crampton, (in the *Dublin Journal of Medical Science*, vol. iii,) in which the rent was distinctly in the situation above indicated.

2. The position of the head of the humerus, immediately under the acromion, might, I conceive, have been assumed after the reduction of a dislocation forwards; and would, in all probability, occur in such a case as the present, in consequence of the want of resistance to the inner por-

tion of the biceps, the long head of the triceps, the coraco-brachialis and the deltoid, muscles usually offered by the long head of the biceps and the outer portion of the capsule. In support of this opinion, we find that (as in Mr. Soden's case) mere displacement of the tendon of the biceps, with slight laceration of the capsule, is sufficient to allow of the close application of the humerus to the under surface of the acromion. Where the injury in the capsule is still more extensive, the tendency of the muscles (in abducting or rotating the arm, for example), would be, to draw upwards the head of the humerus, until, meeting with the acromion, it might find sufficient "point d'appui" for its further movements.

3. The formation of a false joint under the acromion, in consequence of the attrition exercised upon it for a considerable time by the head of the humerus, is by no means an uncommon circumstance. Amongst collections of diseased bones, it is not rare to find porcelainous deposits on the under surface of the acromion, as well as on the articular surfaces naturally entering into the formation of the shoulder-joint. In the museum of University College, for instance, there are six specimens illustrating this fact. And to come more nearly to the point, of five old dislocations of the shoulder, examined and described by Mr. Smith, (*Medical Gazette*, vol. xiv,) in which the long tendon of the biceps was ruptured, no less than four presented this appearance on the acromion. In two other cases of dislocation, described in the same paper, no such false joint existed, but in both these instances the tendon of the biceps remained entire, though displaced from its groove.

These three conditions can, then, only be considered as evidence that the head of the humerus was thrown *in an upward direction*, but nothing further. Let us next inquire what facts should assist us in determining whether it was originally *directly upwards*, or *upwards and forwards.*

The first circumstance tending to throw a doubt over the former of these two suppositions, is the vast amount of injury inflicted on the ligaments and tendons around the joint, without any corresponding evidence of violence having been exercised on the acromion process. For although, in Mr. Smee's case, fracture of the clavicle was found on the same side, there is nothing to prove that it occurred at the time of the dislocation: nor is it the precise kind of injury that would be likely to occur from a direct and rapid application of force from below, or the end of the acromion. In order to produce so much laceration, not only of the muscles but of the capsular ligament, the head of the humerus must (one would think) have passed for some considerable distance from its natural position; and how it could find room for this directly upwards, without splintering off the acromion in its passage, is a problem somewhat difficult of solution.

The facts, however, which most strongly support the view of the dislocation having primarily been forwards and upwards, are derived from a consideration of the state of the muscles around the joint.

The state of the muscles in the more common forms of dislocation has now been examined in many recent cases, and has been found, for the most part, to correspond so well with what might be expected from an *à priori* consideration of the course and attachment of these muscles, that, knowing the direction in which the bone has been displaced, we may, with tolerable certainty, name the muscles most likely to be found torn, or put violently on the stretch.

The converse of this cannot, however, so readily be inferred; that is, knowing the muscles torn across, we cannot in every case infer, from such

facts alone, in what direction the head of the bone escaped. This difficulty arises from the circumstance that (owing probably to individual differences in the size and strength of these muscles, the precise direction of the displacing force, and the state of action of particular muscles at the moment of displacement) the greatest variety is found to exist both as to the number of muscles torn and as to the extent to which they are injured.

To take an example:—In a case described by Mr. Curling, (Sir Astley Cooper on Dislocations, last edition, p. 385,) of dislocation of the head of the humerus forwards and upwards, the supra-spinatus, infra-spinatus, and sub-scapularis muscles were all torn across at their attachments; whilst in a case related by Mr. Key (in the same work), and in another recorded by Sir Philip Crampton (loc. cit.), of the same kind of dislocation, none of the muscles were ruptured, although the supra-spinatus and infra-spinatus were put violently on the stretch.

Nor is this at all surprising, when we consider the great variety of circumstances under which such accidents may occur. In one instance the muscles may act so suddenly and powerfully, and the force may be applied so rapidly, that the parts tear before they can yield; whilst in another case, from the opposite conditions, the corresponding muscles, taken, as it were, by surprise, yield instead of tearing, or offer just sufficient resistance at the moment to cause the head of the bone to roll a little on one side, and pierce the capsule at an interval between the tendons.

Where muscles inserted into opposite sides of a displaced bone are both ruptured, the rupture must be brought about in two different modes; one set of muscles being pushed in front of the advancing bones, the other set being dragged after it; the one being made tense over the head of the bone displaced, the other being stretched over the cavity from which the bone is dislodged.

Of these, however, the latter appears to me by far the more likely to occur, inasmuch as the head of the bone, whilst pushing the muscle before it, and forcing it to describe a curve, tends at the same time to bring the two extremities of the muscles nearer together, and thus causes less actual tension than might at first be supposed.

If this be the case, we may infer that where rupture of fibres, or fracture of the bony attachment, is limited to one group of muscles, (the opposing group retaining their natural insertions and healthy appearance), the head of the bone has probably taken a direction away from the muscles so injured, and towards those that have escaped injury.

To apply this to the cases under consideration. It is remarkable, that in both instances the sub-scapular muscle escaped injury, although the supra- and infra-spinati were completely separated from their insertions. Under the supposition that the dislocation was directly upwards, it is difficult to explain why there should have been this great difference, unless, indeed, at the time of the accident, the arm had been strongly rotated outwards. Even then I am at a loss, considering the relation of the parts, to understand why the supra-spinatus should have received so much injury, when the teres minor escaped altogether.

If, however, we suppose the displacement to have occurred upwards and forwards, would not this difference in the amount of injury produced be more satisfactorily accounted for?

I am aware it may be said that this is only arguing on probabilities, but, unfortunately, the facts collected from recent cases are so meagre on this particular point, that it is the only mode we possess of approaching the question.

The positions I have endeavoured to maintain are—1st, That there is not sufficient evidence in the cases before us, to conclude that they were instances of the rare form of primary dislocation upwards; and, 2dly, That there are reasons for believing that they were originally displacements of the head of the humerus upwards and forwards.

Lancet, May 17, 1845.

ART. 64.—*A new method of Diagnosis in Cataract and Amaurosis.* By Dr. MAGNE.

(*Gazette Médicale*, and *Medical Times*, Feb. 8, 1845.)

It was in the year 1836 that Professor Sanson first observed the circumstance, and, in 1837, he announced it in his clinical lectures, that if a light was placed before the eye of a person afflicted with amaurosis, the pupil having been previously dilated, three images would be perceived; the first, anterior, the brightest, being erect: the second, central, somewhat paler, inverted: and the third, posterior, the palest of the three, like the first, erect. The first is formed by the cornea, the second by the anterior segment of the lens, and the third by its posterior segment. Opacity of the cornea destroys all three images; opacity of the anterior portion of the capsule, the centre and posterior ones; and opacity of the posterior portion of the capsule, the posterior alone. But certain precautions are necessary to be observed: 1st. The pupil must be dilated; this is to be attained by means of belladonna, so that the pupil may be double or treble its original size. If it be necessary to obtain dilatation immediately, atropine may be employed, in the proportion of gr. j to a tablespoonful of water, dropped into the eye. This application is followed by pain, an injected state of the conjunctiva, and an increased flow of tears; but the first is not very intense, and the two last soon disappear. The patient must be requested to keep his eyes well shut; otherwise the solution will escape with the tears, and no effect will be produced. 2d. The eye must be examined in a dark room. These precautions taken, the three images will be seen, should cataract not exist; there are, however, two states in which they are perceived, notwithstanding this disease: (a) when the cataract is very slight, forming a species of haziness, through which the rays of light penetrate, though with difficulty; (b) when the opacity has commenced by the periphery, affecting only a very limited portion of the lens. In the former case, the two posterior images are so pale, that this circumstance, united to the other symptoms, is sufficient to establish a diagnosis; and in the second, the patient, when requested to look at an object in various directions, ceases to perceive it, as soon as the opaque point of the lens intercepts the rays of light, and only one, or at most two, images are perceived, when the eye is examined in that direction. The two following cases are proofs of the exactitude of this opinion. In June, 1841, the Duchess of M—— came to consult Sanson, who was at that time suffering from the disease which ultimately carried him off. Being unable to examine the patient, Dr. M. was requested to do so; and the result was as follows: eyes healthy in appearance; iris moveable; pupils dilated; two posterior images almost imperceptible. Unwilling to say, positively, that he thought a cataract had commenced, the extract of belladonna was prescribed, to be used by frictions; and the next day, Sanson confirmed the diagnosis, which time has shown to be correct. In the same year, and about the same period, Mme. B——, the wife of a member of the Institute,

called upon Sanson, on account of a diminution in the sight of the left eye, and, after examination, she was requested to call again, but ere this period had elapsed, Sanson had breathed his last. After his death, Mme. B. consulted another eminent practitioner, who diagnosticated amaurosis, and prescribed accordingly. Having followed the various remedies ordered, and reaping no benefit, Dr. M. was consulted, and having examined the eye, he thought he perceived an opaque spot, and, on the next day, dilatation of the pupil having been obtained by means of belladonna, such was proved to be the case, as the two posterior lights were not visible. The diagnosis of commencing capsular cataract was confirmed by other practitioners, and still more conclusively by the progress of the disease.

Art. 65.—*On the Diagnosis and Treatment of Nasal Polypus.* By M. Damoiseau.

(*Gazette des Hopitaux*, and *Medical Times.*)

Of the various polypi which affect the nostrils, the mucous are far more frequent than the fibrous, and the errors which may be made in establishing their diagnosis, (not so easy as generally supposed,) may be comprised under three heads. 1st. In some patients, the *septum narium* inclines towards one of the nostrils, so as to form a semi-spherical eminence, red, and easily made to bleed; the mucous membrane is thickened. To discover this peculiarity, the little finger must be introduced into the opposite nostril, when a depression, corresponding to the eminence, will be felt. 2d. A patient suffers from considerable difficulty of breathing through the nostrils, which is supposed to be produced by chronic coryza: this opinion is erroneous, for were it so, why should the coryza exist one day and not the next? Why should it affect in the morning the nostril, which, during the night, was undermost, and disappear two hours after? Whenever did coryza disappear two or three times in the course of four-and-twenty hours? Surely, no inflammation would ever present such variability. It is, therefore, rather a sanguineous congestion in which the mucous membrane of the nostrils increases and decreases in size, in a mode somewhat similar to what may be remarked on the cheeks of females at the cessation of the catamenial flux. The effect is a turgidity of the part, of a red colour, with more or less difficulty in breathing, and the voice becoming nasal; this, after lasting an hour or two, disappears. The treatment consists in reproducing any habitual flux, which has ceased, or in restoring it to its ordinary quantity whenever it is less than normal: at the same time refrigerants and astringents must be employed locally. Sometimes a slight cauterization (not of the whole surface), but of about one third, may be very useful. Finally, if it be owing to a constitutional defect, internal remedies may be requisite. In scrofulous children, the same appearance may be caused by a slight sub-mucous œdema, of the parts: this may be combated advantageously by the iodide of potassium, bitters, tonics, and a good diet; slight cauterization here may, also, be useful. 3d. The mucous membrane, opposite to the anterior part of the nasal process of the os maxillare superius, may present an elevation of about two lines, red, bleeding from the slightest cause, and even producing frequent epistaxis. This tumour, very similar to a polypus, is, in all probability, nothing more than a thickening of the mucous membrane, or of the sub-mucous cellular tissue, produced by an increased accumulation of liquids in the part, since a slight cauterization is sufficient to effect a cure, and that without the

formation of an eschar. These remarks are applicable to a species of cherry-like tumour, formed by the mucous membrane of the urethra in females, and which has been more than once taken for polypus of that part; and likewise for those of the ear, as the following case is a proof. The son of a cutler had suffered for some time from a disease in the ear, supposed to be polypus. On examination, a red tumour of the size of a nut was discovered at the orifice of the meatus auditorius externus; the attempted extirpation was postponed from the want of an appropriate instrument. The trial, however, caused the tumour to bleed freely, and forty-eight hours after, it had completely disappeared. Might it not be presumed that in such cases scarification would be preferable to emollients or astringents?

But admitting the existence of the polypus, established beyond a doubt, how ought the operation to be performed? It must never be forgotten, that in general the left nostril is narrower than the right, and that in females sometimes these parts are but slightly developed. In such cases, it is impossible to employ the ordinary instrument, for in so doing, not only the conchæ or the septum may be fractured, but what is far more serious, the cribriform plate of the ethmöides may be injured, and fatal accidents ensue. A smaller instrument ought, therefore, to be preferred, the more so, as mucous polypi are not so firmly attached as to need considerable force to remove them. When the instrument is introduced, the polypus, if that be fibrous, is easily felt; but if soft (and this is far more frequent), in order to ascertain whether it really is between the blades of the forceps, a rotatory movement must be given the instrument, and if this be possible, there is nothing; if, on the contrary, it is impracticable, it may be concluded that the polypus has been seized. In acting thus, the pain produced by the repeated introduction of the forceps is avoided. When the polypus is deep-seated, the finger, as recommended by Dupuytren, must be introduced into the posterior orifice of the nostrils, so as to push it forwards; it must, however, be done in such a way, as to make the diameter of the finger and nostrils correspond; that is to say, the hand must be placed in supination. It is possible, with these precautions, to penetrate as far as the union of the posterior third with the anterior two thirds. Sometimes the velum palati is raised, so as to close hermetically the orifice. In such cases, the finger must be kept motionless in the mouth, and in a very short time, the velum will be felt re-descending, and the operation can be terminated. Extraction of polypi is not without danger; the cribriform process of the ethmöides may be injured, and fatal meningitis be the result: it is, therefore, useful to prescribe a regimen more or less severe, foot-baths, rest, and inhaling by the nostrils the vapour of the decoctum altheæ officinalis; if a congested state of the parts exist, venesection must be had recourse to. Finally, to prevent a relapse, on the fourth or sixth day, when the inflammatory symptoms have subsided, the parts must, for a fortnight, be touched every second or third day, with a hair-pencil dipped in the following mixture: ℞ Decoct. vinos. rosæ gall.* ʒj., sulph. zinci. ʒj. M. Should the patient be very excitable, the proportion of the sulphate must, at first, be weaker. The result of its application is considerable irritation, lachrymation, sneezing, sometimes to such an extent, that the patient, in spite of

* *Decoct. vinos. Rosæ Gall.* ℞ Rosæ gall. ʒij; vin rubr. lb. ij. Place the wine and rose-leaves in a covered vessel, heat the mixture to near the boiling point, withdraw it from the fire, and allow it to infuse for an hour; finally, filter with expression. Sometimes ʒiss--ʒiiss of alcohol may be added.

the fear of a relapse, refuses to permit its being applied a second time. Care must be taken not to approach too near the cribriform plate, and if inflammation supervenes, appropriate remedies must be prescribed.

SECT. II. ON THE NATURE AND CAUSES OF SURGICAL DISEASES.

ART. 66.—*On Inverted Toe Nail.* By Dr. ZEIS.*

The affection usually known as the inverted toe nail is one which, when we consider the frequency of its recurrence and the intense suffering to which it occasionally gives rise, is of no small importance. The operations generally proposed for its cure are of the most severe kind. Neret (*Archives générales de Méd.*) drives a spatula down to the root of the nail and tears off the inverted edge. Larrey (*Clinique Chirurgicale*) divides the nail with scissors, and forces back the diseased portion. Others destroy part or the whole nail with caustics. Thus Payau (*Revue Med.*), Barbette, and Bordez burn it away with equal parts of potassa fusa and quicklime. Many other proceedings, some less barbarous than the preceding, have been followed by Petrequin (*Archives de Méd.* Belge), Bonnet (*Bulletin de Théraput.*), Lechler, &c.

"It is not," remarks Dr. Zeis, "the painful character alone which renders such operations disgusting to me. My opposition to them is derived from the feeling that they are based upon erroneous principles."

[Dr. Zeis considers it all important in all cases to attend to the general health. His plan of local treatment is, whenever the nail is too short to allow it to grow to its proper length, taking care, however, that it shall not assume a downward direction, by inserting portions of lint behind it and the soft parts.] "Even in severe cases," he observes, "I have seldom failed to secure the entire and permanent relief of the patient by rest, the frequent use of the foot-bath, and the removal of the fungous granulation by which the edge of the nail becomes covered."

The leading propositions which Dr. Zeis seeks to establish are these:—

1. That the so-called growing in of the nail is not in general the result of a too great breadth of the nail, but is caused entirely by inflammation and intumescence of the soft parts.

2. It is not, therefore, to the removal of any condition of the nail that the attention of the surgeon is to be directed, but to the removal of the inflammation and ulceration, and the diminution of intumescence caused by fungous growths.

3. The destruction of the whole or part of the nail is in no case required, and the operation from its severity should be considered unwarrantable.

ART. 67.—*On the Malformations and Congenital Diseases of the Organs of Sight.*

By W. R. WILDE, M.R.I.A. Surgeon to St. Mark's Ophthalmic Hospital.

(*Dublin Journal*, March, p. 42.)

[Our knowledge of the development of the human fœtus, both in the normal and anormal conditions, has of late years been considerably advanced by

* Drei Chirurgische Abhandlungen. Von Dr. Zeis.

the labours of Bischoff, Wagner, Burdach, &c. who have traced the product of conception from the earliest moment of its existence to the epoch of its independent and individual life. We are now made aware, by the researches of these eminent physiologists, that the various parts of the fœtus are gradually superadded, and that it passes through certain separate phases of development, each of which is the type of the permanent and perfect formation of other grades of animal life. The human fœtus exhibits the highest point of development to which the primary cell called into life by the act of conception can under the present order of things arrive, but it may under certain circumstances fail in accomplishing this perfectibility, and stop short, or, in the language of physiologists, be arrested in any one of the phases, through which it is destined to pass. The study of this part of the science of embryology is of the most interesting kind, and is now making rapid advance under the investigation of many able physiologists. Among the most interesting additions to our knowledge of the subject of congenital imperfection, must be mentioned, an essay by Mr. Wilde on the malformations to which the organization of the eye is liable, and which we shall proceed to condense. The author, after some general observations respecting the circumstances attached to fœtal life, thus expresses himself]:—

"The eye does not become a perfect whole at one and the same instant, nor is its perfection as an optical instrument completed until the last month of intra-uterine existence. Did space permit, it would be instructive to sketch the growth and development of this organ from the researches of the most recent observers, but as this cannot be fully accomplished, we shall proceed to inquire into those vices of conformation, the results of arrest of development, in its growth, transparency, and valvular arrangement, as well as those diseases which, being present at birth, are regarded under the general head of congenital defects."

Malformations and Congenital Diseases of the Ocular Appendages. 1. *Epecanthus.* This disease consists in a superfluity of skin over the root of the nose, which falls outward in a crescentic fold so as to hide completely the inner canthus, and even the inner margin of the cornea in extreme cases. The disease was originally noticed by Schön (*Handbuch der Path.*) and is described by Von Ammon, (*Zeitschrift für die Ophthalmologæ.*) Mr. Wilde has seen two well marked cases in this country; one a girl æt. 7, in whom there was the additional deformity of flat nasal bones, giving her a Kalmuc or Chinese appearance.

2. *Ptosis* is so commonly observed in new-born infants as the result of accident, disease, or congenital malformation, that there are few practitioners who have not witnessed it; it is not necessary therefore to describe its appearance. When it occurs as the result of developmental defect, absence or a rudimentary form of the levator palpebræ has usually been observed. There is, however, it must be remembered, another form of ptosis appearing at birth, which is caused by undue pressure upon the head during abstraction. The most remarkable cases of congenital ptosis is one recorded by Seiler, and figured by Von Ammon, in which the upper lid was so long as to overlap the margin of the lower.

3. *Ectropium* is rarely seen as a congenital defect. Two German writers, however, Schülte (*Gräfe und Walther's Jour.* Bd. 9), and Loschge (*Isenflam's und Rosenmüller's Beitrage z. Zergliederunsk.* Bd. 1), have recorded cases. The appearance is similar to that which occurs in after life.

4. *Entropium and Trichiasis* have been observed by the author, who believes that the disease may arise from inflammation occurring in utero.

5. *Anchylo-blepharon, or adhesion of the tarsal margins*, appears to be the natural condition of the fœtus of a certain period, and persists in the feline tribe till several days after birth. The younger Himly tells us that this union is maintained by a continuity of the palpebral conjunctiva: that this is also a natural state of the human fœtus at a certain period, is believed by Meckel and Von Ammon; an arrest of development, therefore, at this period, will readily account for the occurrence of anchylo-blepharon. It is still a matter of discussion whether the junction of the lids in the human fœtus, anterior to the fifth month, is the result of membranous union, or simple mucous adhesion.

6. *Phimosis-palpebrarum* is a term which has been applied by Kimberger, Von Ammon, and others, to a natural defect of the eyelids, in which the palpebral orifice is evidently too small. Chelius of Heidelberg (*Handbuch der Augenheilkunde*) has recorded three well-marked instances of the affection.

7. *Coloboma palpebræ*, or cleft lid, is mentioned by Bannister near a century ago. As in hare-lip, the cleft lid is generally confined to the upper. It has been found in conjunction with hare-lip, and fissure of the iris.

Malformations of the Lachrymal Organs. 1. *Absence of the lachrymal gland.* This gland which, according to the writer before mentioned in the *Encyclopédie Anatomique*, is first recognized in the first half of the 4th month, is occasionally wanting at birth. A case is recorded as early as 1721, by Botin, in which there was likewise deficiency of the globe of the eye.

2. *Fistula lachrymalis.* In *Blazius' Zeitschrift* for 1837, a remarkable congenital case of this affection is mentioned by Dr. Behr of Bernherg. The case is considered by Mr. Wilde to be unique.

Malformations of the Globe. 1. *Microphthalmus* and *Megalophthalmus.* The former of these terms is applied by the continental writers to a peculiar condition of the eye, when there appears to be an arrest of development of the organ at some particular period of its growth, without either atrophy or disease, but when at birth, the eye, although it may appear perfect as an organ, does not bear its proper proportion to the rest of the body. Three varieties of the affection have been described, one where arrest took place when the iris was just forming; another which occurs at a more advanced period, when the iris is not perfected, and consequently gives rise to coloboma iridis, or cat's pupil. The third is when all the parts are natural, but there is frequently an irregular position of the pupil. Numerous cases of this defect are recorded by Schon, Fischer, Weller, and others. Microphthalmus sometimes also arises from disease occurring in utero, when one or both organs are diminished from atrophy; in these cases there is generally cataract, disease of the choroid, and immoveable iris, appearances which sufficiently distinguish it from an arrest of development.

Megalophthalmus is usually a pathological appearance caused by hydrophthalmia, either existing alone, or coexisting with hydrocephalos, or other cerebral diseases.

2. *Anophthalmus*, or congenital deficiency of the organs of sight, has occurred in the experiences of several British surgeons. In 1831, Mr. Walker communicated to the *Lancet* the cases of two sisters, one five years of age, the other four months, in whom both eyes were completely wanting, the orbits being filled up with dense cellular tissue. A case in point has likewise been communicated to the author by Mr. Estlin of Bristol.

3. *Nystagmus*, or oscultation of the eye, is a constant symptom in those born blind. It is an attendant upon congenital amaurosis, but is more frequently seen in congenital cataract. The author has lately observed this symptom in a case of congenital fungus hæmatödes of both eyes. (p. 42.)

Art. 68.—*On the Pathology of Toothache.* By Dr. Heilden.

(*Medical Times*, March 21, 1845.)

Toothache may depend either upon congestion, inflammation, or a lesion of innervation. 1st. *Congestion: this may have its seat either in the membrane exterior to the fang of the tooth, in that lining its central canal, or in the ganglion, which supplies the tooth with nerves.* Congestion, when seated in the lining membrane of the fang, may be known by lancinating, throbbing pains, which are increased by any excitement of the system; these pains are variable in their character, sometimes lasting but for a few minutes, and again for as many hours, they are generally increased, towards evening, and when the patient is in bed. The tooth, whose lining membrane is affected, is sensible to the touch, or to pressure, and frequently conveys the sensation of being somewhat above the level of the surrounding teeth. The frequent application of cold water to the affected tooth is one of the best means of cure that can be adopted in this form of odontalgia. 2d. *Congestion in the lining membrane of the canal, and of the dental nerves.*—Toothache dependent upon these causes may be distinguished from the variety just described, by the tooth not being painful on pressure, nor conveying the sensation of prominency over its fellows. It may also be distinguished by the effect which cold water produces upon it; if the tooth be carious at the crown, cold water immediately gives relief, but if it be not so, the pain undergoes an exacerbation for some time, but under the use of the remedy it eventually disappears. Young, plethoric persons, and pregnant women, are those most subject to this form of toothache. In obstinate cases, besides the local application of cold water, it may be necessary to use the foot-bath, and administer purgatives. Where caries of the tooth exists along with this form of congestion, timely plugging must be had recourse to. All stimulants, such as the tinctures in common use for curing toothache, must be avoided here, as they only increase the mischief. *Inflammation.*—This process when occurring in the teeth of a healthy individual, will produce the phenomena of healthy inflammation in any other part of the body; in individuals affected with gout, rheumatism, or scrofula, it will present the specific character of these diseases. Inflammation of the internal lining membrane of the tooth-fang (periodontitis), occurs much oftener in carious than in healthy teeth; it is characterized by a dull aching, rather than actual pain, from which the patient fancies he obtains relief by pressing his teeth strongly together. This dull aching after some time is exchanged into an acute, *boring* pain, which extends to the neighbouring teeth; at this stage, the affected tooth seems more elevated than its fellows: and this sensation prevents perfect closure of the mouth, and to a great degree interferes with mastication. In some cases this local inflammation causes severe constitutional disturbance, heat and redness of the cheeks, severe headache, and general febrile irritation. In this state, if nothing be done to check the local inflammation, this acquires greater intensity. The acute boring pain is now changed into a dull aching attended with throbbing, if the gum about the affected tooth be examined, it will be found intensely inflamed, the tooth itself is *now* visibly

longer than the surrounding ones, and loose; pressure makes the patient feel as if it were about to start from its socket. All these are evidences of suppuration at the root of the tooth, and if it be now extracted, a drop of matter will be seen attached to its root. In cases of intense inflammation of the tooth-fang, the process of inflammation may not be terminated by the formation of matter: inflammation proceeds outwardly to the gum, the alveolus is absorbed, and a portion of the matter formed at the base of the tooth is thus evacuated, when the opening in the gum closes for a short time, until the matter again accumulates. Thus a sort of fistula is formed which can only be healed by the extraction of the tooth. The mischief may not be confined to the root of the tooth alone—which becomes absorbed at its extreme point and roughened,—but may also extend to the jaw-bone and render it carious. It sometimes happens that the cyst containing the pus at the root of the tooth, becomes changed into a mass of pappy consistence, which, comes away with the tooth on the latter being extracted. The treatment of this variety of odontalgia must be strictly antiphlogistic. Should the local application of cold fail in completely removing all the symptoms, leeches must be at once and freely applied to the gums. Where suppuration seems inevitable, a gently diaphoretic treatment with fomentations of warm water, or warm decoction of poppies, or marshmallow, or a solution of extract of henbane, in the proportion of five or ten grains to four ounces of warm water, will be found to assist materially the maturation of the abscess; as soon as the pus has been evacuated, the diseased tooth must be extracted. It very often happens that a great number of the teeth are loosened, without any mechanical cause; this may depend either upon a sub-inflammatory affection of the lining membrane of the alveolar process, or upon that form of cynanche, denominated "Parotidea." In the latter instance time alone will effect a cure; the former requires for its cure repeated application of leeches over the affected portions of the alveolar process.

Wiener's Zeitschrift.

SECT. III. ON THE TREATMENT OF SURGICAL DISEASES.

ART. 69.—*Treatment of Fistula in Ano by Ligature.* By Mr. LUKE.

(*Lancet*, Feb. 22, 1845.)

The advantages of this method over that by the knife are: 1st. The shorter period which usually elapses before the final cure. 2d. The less pain which is felt during the treatment. 3d. The absence of the dread which the knife generally inspires, and the consequent inducement which it offers to the patient to submit to effective curative treatment; and, lastly, the avoidance of all hemorrhage. The treatment is to be conducted in the following manner: An eyed probe, armed with dentist's silk, is introduced through the fistula into the rectum, from whence the silk is withdrawn through the anus, by means of a spring-catch introduced into the rectum upon the finger of the operator. The parts to be divided are then inclosed between the two extremities of the ligature, to which a small fistula-tourniquet is subsequently attached, by passing them through holes provided for the purpose. The requisite amount of tension is maintained by a screw. Care must be taken that the ligature be not so tight as to cause more than slight uneasiness. After the lapse of a few days, ulceration of the inclosed

part commences, and the tourniquet becomes loosened, indicating the necessity of the ligature being made tighter.

[Nine cases are appended, in which the proceeding was attended with perfect success.]

ART. 70.—*Description of a New Instrument for Ligature of Fistulæ in Ano*, by Dr. NELKEN.—This instrument is composed: 1st, of a rod, about $11\frac{1}{2}$ inches in length, the upper third of which is divided into four equal parts, united to each other by hinges, so arranged, that they can be closed only in one direction, the last being furnished with a knot, and a hole to pass the ligature; and 2d, of a tube through which the former is passed when threaded. The finger being placed in the rectum, the apparatus thus prepared is passed upwards into the fistula, until the extremity reaches the finger, the tube is then withdrawn to an extent equal to one of the four divisions of the rod; the whole is next pushed forwards, the finger in the rectum causing the rod to bend downwards as it penetrates into the intestine; the same manœuvre is repeated until the ligature appears at the anus, when the surgeon seizes it, and terminates the operation.

Medical Times, Feb. 8th.

ART. 71.—*Erectile Tumour of the Eyelid treated by Inoculation with Croton Oil.*

By ALEX. URE, Surgeon to the Westminster General Dispensary.

(*Medical Gazette*, March 21, 1845.)

Mary D., æt. $3\frac{1}{2}$ months, admitted Dec. 30, 1844. At the inner angle of the right upper eyelid, is an erectile tumour, as large as a currant. It appeared as a scratch at birth, and has progressively reached its present size, growing very rapidly during the last month. There is a reddened villous condition of the palpebral conjunctiva subjacent to the tumour. The child is in other respects healthy. I first tried the plan of subcutaneous puncture, employing for this purpose a common iris knife. A repetition of this proceeding, after a few weeks, appeared to have no effect in reducing its volume. Towards the middle of February, I had recourse to inoculation with croton oil. I made several minute punctures with a cataract needle smeared with the oil, over the surface of the nævus. This gave rise to redness and swelling which lasted a few hours, and, subsequently, to small points of suppuration. This tiny operation was repeated at an interval of a week. The result has been a rapid diminution, with withering of the tumour; and now scarcely a vestige remains, with the exception of a slightly puckered speck at the corner of the eyelid.

[Mr. Ure remarks that the employment of the knife is inadmissible in cases like the present, not only on account of the hemorrhage, but from the liability to eversion, as a consequence of cicatrization. Seton, escharotics, vaccination, are likewise contra-indicated from the risk of violent irritation or sloughing. The plan of treatment adopted in this case was first proposed by M. Lafargue, and promises, if the present example may be taken as a criterion of its operation, to be one of considerable value and efficacy. Mr. Ure cautions the surgeon not to make more than five or six punctures at one time.]

[Upon the same subject we find the following remarks in a recent publication by Dr. Marshall Hall.* After alluding to the various proceedings

* Observations in Medicine, London, 1845.

which are generally adopted by surgeons, he proposes a method, which, though slow in its operation, appears to have been successful in several cases. Dr. Marshall Hall describes his proposed plan in the following words]:—

"The mode of cure to which I have alluded consists in passing a needle, of moderate size and with cutting edges, through the nævus, so frequently as to induce adhesive inflammation, with the deposit of lymph, and so as to obliterate and consolidate the vessels of which it is composed, yet so slightly as to incur no risk of inducing sloughing. The needle must be passed in several directions from one point in the circumference of the nævus to several points more or less opposite. The operation must be repeated at distinct intervals of two or more months, according to the state of the case and the progress of the cure." (p. 223.)

Art. 72.—*The Treatment of Fractures by Larrey's Immoveable Apparatus.*

The experience of campaigns in different climates has clearly demonstrated the great advantage of a regulated temperature in the healing of wounds, especially when combined with certain provisions for maintaining a motionless condition of this part. The contrivance called by the above name was invented by Baron Larrey, under the pressure of the emergencies of the Russian campaign.

The following are his instructions for its arrangement:—"If a fracture of a limb be complicated, with an external wound, we should simplify it as much as possible, by freely incising its edges, and extracting all foreign bodies. When this has been done, we should close the wound by a piece of linen, on which some balsamic substance, as styrax ointment, has been spread. Pledgets of lint are then to be placed over the dressing, so as to fill up any anfractuosities that correspond to the wound; as also some square compresses, dipped in a wash made of white of egg and camphorated spirit, or vinegar. These compresses are to be carefully adjusted, while an assistant maintains the broken bones in correct apposition. The compresses are kept in situ by an eighteen-tailed bandage, which, when properly applied, keeps everything in its right place. The foot and ankle-joint should previously be enveloped in long compresses, wetted with the same fluid. A pad having been placed under the tendo-achillis, to make all level and even, the surgeon is then to take two cylindrical rolls of new straw, and wrapping them up in the opposite ends of a towel or sheet, laid under the injured limb, he is to apply them to each side of the leg, having previously interposed two or three flat cushions of chaff, to prevent injurious pressure. The whole is then tied together by tapes. As a substitute for the footboard, Larrey uses a folded sheet, placed like a stirrup under the sole, and tightly fixed on each side of the leg to the straw rolls."

This apparatus is said by its inventor to be equally serviceable in fractures of the body or neck of the femur.

Baron Larrey's Med. Campaigns, Med. Chirur. Jour. Jan. 1845.

Art. 73.—*Ununited Fracture treated by Acupuncturation.*—A case of ununited fracture, thus treated, is recorded in the *Giornale per servire ai progressi*. A man of good constitution, æt. 26, met with a simple fracture of both bones of the forearm. Five weeks after the accident no union had occurred, and the apparatus was again applied, and the limb kept in a state

of perfect rest during four weeks longer. At the end of this time, finding the fragments still ununited, M. Wiesel determined upon the employment of acupuncturation, which he did in the following manner:—Between the fragments of the ulna he introduced two needles, long enough to pass completely through the false joint, and allowed these to remain in place during six days, by which time they had produced great tumefaction of the part, and caused much pain. Fifteen days after this, a similar operation was done upon the radius, which, after a few days, was followed by acute pain and slight suppuration. After the application of the needles the arm was carefully supported in splints, and at the end of six weeks consolidation was found to be complete.

Medical Times, Jan. 11, 1845.

ART. 74.—*Treatment of the Sigmoid Contortion of the Vertebral Column.*

(*Brit. and For. Medical Review*, April, 1845.)

Dr. Zink, of the Orthopedic Institution at Vienna, appears to have bestowed much attention to that one form of spinal contortion which has been termed the sigmoid flexure of the column. It generally commences from the fifth to the eighth year of childhood, between the third and fifth dorsal vertebræ, and the deviation is almost invariably towards the right shoulder-blade.

On careful examination at this period, we discover that the right shoulder exhibits an excess of nutrition over the left, and this is apparent even in the bones, and especially in the right shoulder-blade. In consequence of this, such children exhibit a remarkable tendency, in spite of all admonitions to the contrary, to lean towards the weaker side, and this even during sleep, while on every occasion requiring muscular exertion they prefer the stronger hand.

"From repeated observations," says Dr. Zink, "I am convinced that the greater part of the mischief here detailed is effected during sleep, and consequently is in operation during one third of the patient's daily existence. The head then leans down towards the left side, and the lung on that side is compressed, one lung only (the right) performs its full office, and the muscles of respiration on that side are in a state of activity, greatly exceeding that of the left. . . . . I have also ascertained that the convexity of the deviation of the spine accords exactly with the insertion of those muscles which are most active in the process of respiration. This deviation from the perpendicular, so high up in the spinal column, is often overlooked, and the inferior and secondary contortion to the left side in the lumbar vertebræ is often regarded as the primary affection."

This form of scoliosis occurs chiefly among the children of the wealthy, and is much more frequent among females than males. It is curable as long as the vertebræ can be brought back to their natural position. Dr. Zink lays much stress upon the necessity of attending to the position of the body during sleep, and he believes that many attempts to cure are unsuccessful from the injurious posture being resumed during the period of repose. The watching of the patients during sleep, as may well be imagined, has been the most tedious and costly portion of the cure. During the day, the ordinary gymnastic exercises were employed, taking care that the weaker side especially should be kept in constant action. Dr. Zink believes that he has obtained much benefit also from frequent singing, which dilates the whole chest equally.

Art. 75.—*On Extension in the Reduction of Dislocations.*

By H. Hancock, Esq., Surgeon to the Charing Cross Hospital.

(*Provincial Medical Journal*, February 19, 1845.)

With respect to extension, the question at issue is, as to the part to which the power is to be applied. All the older writers, and most surgeons in the country, have preferred its application to the bone luxated; whilst others, as well as the continental surgeons, are strongly in favour of the extension being made from a more remote situation, i. e., from the wrist for the shoulder, and from the ankle for the hip. Each method is supported by valid arguments, and in like manner each is liable to objections adduced against it.

Among those who favour the former method, (application of force to the bone luxated,) we may enumerate Sir Astley Cooper, Pott, Hey, Lawrence, Guthrie, Liston, Paré, Petit, Duverney, Callisen, Bromfield, Sedillot, Allan, Latta, and almost all the English surgeons.

Mr. Pott observes, "that when the extension is applied as far as possible from the luxated bone, that part of the extending power is lost on the joint, intervening between the dislocation and the part at which extension is made, and that the force necessary to be exerted in some instances would have a bad effect on the intervening joint."

Sir Astley Cooper states, "that as far as he has had an opportunity of observing, it is generally best to apply the extension to the bone which is dislocated; but that dislocations of the shoulder are exceptions, in which he mostly prefers to reduce the head of the bone by placing the heel in the axilla, and drawing the arm at the wrist in a line with the side of the body." Nevertheless, in the figures delineated in that gentleman's quarto work, the extension is applied above the elbow, even where the surgeon's heel is represented in the axilla; and moreover, where he describes this method, he says, "I have in many instances extended from the wrist by binding a handkerchief just above the hand, but more force is required in this, although it has the advantage of the bandage being less liable to slip."

Allan remarks, "that by adopting the practice of Desault and the French surgeons, we are in great danger of injuring the elbow, or wrist-joint, or both; besides, by extending the forearm, we put the long head of the biceps on the stretch, which will not only produce great pain, but impede reduction."

Mr. Syme, of Edinburgh, says, "that the force may be applied, so as to act either directly on the bone itself, or on a part of the limb separated from it by one or more articulations." It has been objected to the former mode, that it causes compression of the muscles opposed to reduction; and to the latter, that by keeping the limb straight, it is still more adverse to their yielding. It does not appear, however, that any practical inconvenience is experienced in either of these ways. The former method is, on the whole, more convenient in most cases.

Petit, Duverney, and others, with Pott, affirm, "that in dislocations in general, the extension and counter-extension must be made upon those very bones that are disjointed, and not upon those next to them; as all the force which is applied to the bone below must necessarily be lost in the articulation which is not luxated, and of little or no service to that which is. This is owing to the yielding nature of the joint."

M. Sedillot, also, after describing his apparatus for reducing dislocations, adds, "the projection of the condyles renders extension much more easy

at the elbow than at the wrist, where we always press on the styloid process of the radius and ulna, and moreover cause great pain. These motives, joined to that of the traction, being more direct, led me to adopt it, in spite of the imaginary inconvenience of compressing some of the fibres of the biceps and triceps muscles."

On the other hand, some of the best surgeons in France, among whom we number Fabré, D'Apony, Desault, Boyer, Richerand, Leveillé, Malgaigne, and Velpeau; White, of Manchester; and Crampton, of Dublin; advise the extending force not to be applied on the luxated bone, but on that with which it is articulated, and as far as possible from it. They affirm that this plan has the advantage of not compressing the muscles that surround the dislocated bone, nor exciting them to spasmodic contractions, which would resist reduction, and, moreover, that the extending force is much more considerable than in the other mode, since, by using a long lever, we obtain a greater degree of power.

This method was not so generally adopted, until MM. Fabré and D'Apony pointed out its apparent advantages, and rendered its employment more systematic. Ambrose Paré, who was opposed to it, writes that it was familiar to the chimney-sweeps of his day; but this by no means depreciates the value of the method, since some of our most valuable and successful measures are those derived from the ignorant.

The muscles which they by this means avoid pressing or exciting, are those which proceed from the shoulder to the forearm, or from the pelvis to the leg.

Boyer asserts that surgeons failed, from applying extension and counter-extension directly on the bones displaced; and hence the numerous inventions, which all fell into disuse after Fabré and D'Apony demonstrated the utility of applying these forces as far as possible from the seat of luxation.

Mr. Crampton says (in regard to dislocations of the shoulder), in Dublin as in Paris, and in Paris as in Germany, generally, we apply our extending power to the forearm, in preference to the arm. The application is far less painful, and the surgeon has more power in directing the motions of the limb.

The arguments hitherto advanced against the application of the extending force on the bone luxated, therefore, are these:—The non-compression of the muscles which surround the bone, rendering the extension more considerable, diminishing pain, and increasing the length of the lever.

In its favour: that it is more convenient, prevents the extending force being lost in the intermediate joint by the yielding of the ligaments, admits of the biceps being relaxed, and causes less pain.

Art. 76.—*On the Treatment of Cleft Palate.* By Mr. Fergusson.

(*Reported in Medical Times.*)

In a Paper read before the Royal Medico-Chirurgical Society, the author commences by making some general remarks on the operations for cleft palate performed in this country and abroad. He then proceeds to give a detailed account of a dissection he had an opportunity of making, of the muscles which operate upon the soft palate, in an individual who had both the velum and a portion of the hard palate cleft. This description is followed by an examination of the opinions of different eminent physiologists, concerning the motions of the velum palati and its arches during the acts of deglutition, and by the author stating his own views as to the actions of the various muscles when the palate is cleft. This part of the subject he

further illustrates by describing four different states in which the flaps on each side may be seen upon looking into the mouth of a person who has a cleft palate, and irritating them in different ways. By pursuing this course of anatomical and physiological inquiry, he arrives at the following conclusions:—1st, That the flaps are slightly drawn upwards and to the sides, when the levator palati contracts; 2d, that when the levator palati and palato-pharyngeus act strongly and together, the flaps are so forcibly drawn from the mesial gap, that they can scarcely be distinguished from the sides of the pharynx; 3d, that the flaps are forced together, and the edges come into contact, when the superior constrictor muscle contracts during the act of deglutition; 4th, that the circumflexus palati possesses but a feeble power over the flaps; lastly, the fibres of the palato-glossus were very imperfectly developed in the specimen in his possession. The chief object of his paper is to communicate a novel plan of operating in staphyloraphy, founded on the above investigations, and which he has put in practice with most satisfactory results in two cases during the last twelve months. The principle of his new proposal is to divide those muscles of the palate which have the effect of drawing the flaps from each other, and widening the gap between them when they contract, so that the stretched velum may be in a state of repose, and the joined edge may not be pulled asunder by any convulsive action of the parts during the process of union. In other words, he advises, as an accessory to the operation of staphyloraphy, the division of the levator palati and palato-pharyngeus muscles; and, if requisite, the palato-glossus. In bringing forward this plan, he reviews the different modes of operating which have been pursued by numerous distinguished surgeons who have written on the subject; and he concludes by entering into several minute details regarding the steps into his own operation, and by describing the particular forms of instruments which he has found best adapted for his proceedings.

Art. 77.—*Observations on Aneurism.*

By J. Luke, Esq., Surgeon to the London Hospital.

(*Medical Gazette*, May 10, 1845.)

[In the paper from which the following remarks are extracted, the author relates an example of the spontaneous cure of what he terms tubular aneurism. The patient was a muscular man, æt. 31. The aneurism was situated upon the femoral artery. The only application made to the tumour was that of adhesive plaster, and he was left with the injunction to remain in bed in order to determine whether any increase took place in its dimensions. Upon removing the plaster at the end of a week, it was found that a great change had taken place in the tumour; in fact, pulsation had entirely ceased, not only in the tumour itself, but in all the arterial branches below it. The unexpected issue of the case gave rise to the observations which we here append]:—

"In the brief remarks which I intend to make upon the above very interesting case, I would wish first to call attention to the unsatisfactory use of terms employed to distinguish the different kinds of aneurismal diseases from each other. It may be generally asserted that any change of terms in common use is decidedly objectionable, so long as they convey definite ideas; but when they fail to do this, a change becomes desirable. It is for this reason that the terms *true* and *false*, and *diffused*, as applied to aneurisms, are unsatisfactory; because they fail to convey a meaning uni-

formly of the same import to all, and require some circumlocution for their explanation. Thus, some surgeons employ the term 'true' to designate all kinds of aneurism in which a sac is formed as a result of disease; while others restrict it to dilatation of the tunics only. Again, others exclude the uniform dilatation of the tunics altogether, and mean merely by the term a partial dilatation of one side of an artery. So also the term 'false' is used to designate all aneurisms without previous dilatation of the tunics, whether they are the result of ulceration, rupture, or wound; while some apply the term 'diffused' to aneurisms arising from the latter cause. However much I may be generally indisposed to change of terms, I think these may with advantage be allowed to become obsolete, especially as others may readily be found which will designate the particular forms of disease by their own import.

"The different kinds of aneurism may conveniently be thus designated. 1st. To the most common kind, characterized by the existence of a sac, the term 'saccated' may with propriety be applied as simply indicative of that fact, without entering into any speculations as to the means by which the sac is produced. If we wish to make distinctions of the saccated form, we might use the term 'traumatic' for those forms of it which are the result of wound. 2dly. There is a form of aneurism characterized by a pretty nearly uniform dilatation of the tube of the artery, of which the case above related forms an example. This, by some surgeons, has been considered not to be aneurism at all; while by others it has been regarded as the true form of that disease. From the circumstance of the tube of the artery undergoing a pretty uniform dilatation, I think that the term 'tubular' would not be inappropriate, and would express adequately the kind of disease meant to be designated. 3dly and 4thly. The terms 'dissecting aneurism' and 'varicose aneurism,' are sufficiently expressive of the forms of disease to which they are at present applied, and need no further observation. But, 5thly, the term 'aneurism by anastomosis,' as it involves an hypothesis, may be advantageously changed for 'capillary aneurism,' as merely conveying an idea that the minute or capillary vessels are the structures affected. Thus we have—

"1. Saccated aneurism, including traumatic;

"2. Tubular aneurism;

"3. Dissecting aneurism;

"4. Varicose aneurism;

"5. Capillary aneurism; under which terms may be embraced every known variety.

"With regard to the case above related, the first circumstance which calls for comment is the external form of the tumour. In this respect it is generally by no means so globular as the saccated disease, but is usually oval, or rather fusiform, with the long axis lying in the course of the arterial trunk. The external form results from the manner in which the disease is developed, which in cases similar to the above is by a limited but uniform expansion of the arterial tunics with a corresponding enlargement of the area of the vessel at its dilated part. The extent of the vessel so dilated varies, but above and below the diseased part the artery retains its healthy dimensions. From this state of things arise some important considerations.

"It will be recollected, that in saccated aneurism the blood is thrown out of the course of circulation into the sac, where the influence of the current is so far diminished in certain cases, as to allow the contents to become partially quiescent, and thereby disposed to coagulate in the tubular form,

however, the whole force of the current passes through the centre of the dilated parts, and must obviously tend to counteract any disposition to coagulation of the blood contained therein. It is to this cause that the absence of solid contents has been usually attributed, as well as the greater softness of the tumour, and its capability of being emptied by pressure.

" Another circumstance worthy of observation is the slow rate of increase in tumours of this description. This is what might be expected when the resistance of the arterial tunics, and the force of the blood current are nearly on a par. But it might be supposed that as the tunics become thinner by expansion, their resistance would be diminished, and that they consequently would yield more rapidly as the tumour became larger. I believe the reverse to be the fact, arising from the force of the circulation upon the interior of the expanded part being diminished in a greater ratio than the resistance of the vessel, from the well-known causes which influence the force of currents passing from small tubes into those of larger dimensions. It is not difficult to imagine that in the progress of tubular aneurism a status may at last be arrived at, in which no further increase of the tumour would take place. Nor am I satisfied that in the above cases such a status had not been attained; for it was remarked by the patient that he had not observed any increase in the swelling for the last twelve months.

" The last and most important consideration is that relating to the means by which the cure in the above case was effected. On this subject we must be content with mere surmise. It is the common practice in such cases, and in those which take place in the saccated form, to attribute them to the occurrence of coagulation of blood within the artery or within the sac, which prevents the ingress of fresh blood, and thus stops the progress of the disease. I am disposed to think that such explanation is unsatisfactory, both in reference to the case related, and to aneurisms in general when they undergo spontaneous cure.

" The question is one of some moment, and perhaps may merit a few observations, particularly as it has a practical bearing. It is well known that in examining the sac of an aneurism, it is not unusual to find both fluid and solid contents, the first being blood, the second supposed to be blood in a coagulated state, but changed in character. An examination of the latter, as pointed out by Mr. Wardrop, in ' the Cyclopædia of Surgery,' shows that it consists of two portions, one coloured, the other nearly colourless. It is to the latter that I wish to direct attention, because it is on this that the curative process mainly depends. This portion adheres to the interior of the sac; but the adhesions are easily separable, so that it is sometimes found more or less detached. It consists of concentric layers, which are generally supposed to be deposited in succession. Mr. Wardrop, however, has adduced some reasons for supposing that these layers are the result, not of coagulation, but of an action taking place in the parietes of the sac. The reasons upon which he bases his opinion, are the ' great difference in the anatomical characters of a common clot of blood, and a fibrinous concretion,' the ' concreted fibrine having its anterior surface smooth and polished,' and lastly, the ' vascular connexion,' which he believes to exist between the concretion and the sac. The additional reasons which have convinced me that the common explanation of these concretions is incorrect, are derived from the examination of the fibrinous layers themselves, and the occasional interposition of coloured coagulum between them. It is not in every case that these coloured interpositions are found; but when found, these relations to the colourless laminæ are most important to, if not conclusive evidences for, the elucidation of the subject.

"If we adopt the common supposition that the whole solid contents of a sac are mere deposits from or coagulations of the blood, the explanation of the intermixture of coloured and colourless layers would be impossible. Under a real similarity in the process of formation, it seems probable that all the layers would be of one nature, not as is seen, some coloured, and others without colour. I think, therefore, that we must discard the opinion that the solid contents of an aneurism are the result of coagulation only. All difficulty, however, vanishes if we presume two separate actions. There can be little doubt that the coloured contents are coagula of blood, as they possess characters sufficiently recognizable. It is in looking to the position which these occupy in respect of the uncoloured or fibrinous concretions by which they are surrounded, that we are led to a satisfactory explanation of the mode of production of the latter. When we look at these clots, we find them either entirely surrounded by colourless fibrinous concretion, and excluded thereby from the fluid blood passing through the sac, or lying between the fibrinous concretion and the sac itself, in which latter situation they may or may not be excluded from contact with the fluid blood. When in the former of these two portions we cannot account for their insulated situation, unless by supposing the clot to have been formed upon the surface of the fibrinous mass, and to have become subsequently inclosed by new deposits of fibrine. But in the latter situation blood may be insinuated between the fibrinous concretion and the sac, in which case it will there coagulate and retain its characteristics.

"Having determined the points, we have next to discern on which surface of the fibrinous concretion these minute clots are really formed. If it be on the interior, or that surface which is in contact with the circulating blood of the sac, it is then no doubt derived from that blood; and the fibrinous concretions, by which it eventually becomes inclosed, are equally derived from the same source. On the contrary, if it be on the exterior, or the surface in contact with the sac, the fibrinous concretions which subsequently inclose it are, with equal certainty, derived from the sac; since by the formation of new adhesions after the clot has formed, the circulating blood becomes excluded, and no other source remains than the sac, from which any secretion of new matter can be derived.

"I am disinclined to the former supposition, from my belief that had the clot been so formed, the subsequent deposits by which it became inclosed would be of the same character and colour as the clot itself; and a wholly different appearance from that which we actually find would result therefrom. On the other hand, I adopt the latter suppositon, not only as more in accordance with our general ideas of the reparative process, but also, and more particularly, from the observations I have had an opportunity of making upon the aneurismal contents. Thus a small-coloured clot had formed between the sore of an aneurism and the fibrinous concretions contained within it, arising, I believe, from the passage of the blood into a space left by a slight separation of the two from each other. The further ingress of blood had been prevented by new adhesions, and the process of inclosure had commenced by the deposit of a thin layer of fibrinous matter upon its exterior surface, which matter adhered to the sac, and had no doubt been formed subsequently to the coloured clot. A similar inclosure had occurred to another clot in the same aneurism, but which, by the deposit of a greater number of fibrinous layers, had become more deeply buried within the mass, and consequently more central with respect to the aneurismal tumour.

"Taking then the order of sequence of the deposits to be such as I have stated, it follows that, the blood not having access to the external fibrinous layers, by reason of their adhesion to the sac, any increase which accrued to them could not have been derived from the blood, but must have necessarily proceeded from the sac itself, with which alone they were immediately connected. Granting this mode of formation of the exterior layer, a strongly presumptive proof is established, that the whole of the fibrinous layers were formed in the same manner, each pushing its predecessor forward upon the cavity of the sac, and being in its turn pushed forward by its successor, and inclosing a portion of coloured coagulum which had been fortuitously congealed upon its surface.

"The action by which the vessels of the sac deposit the fibrinous layers is probably of the plastic kind, and bears a certain analogy to the adhesive processes in other parts. Such being the probable means by which nature attempts a cure in these cases, we are admonished by the knowledge of them so to conduct our treatment, as at least not to counteract her efforts. We may thus assign a reasonable ground for objecting to a practice which experience has already shown to be injurious; and can view the abstraction of blood not as a means of promoting coagulation, but of diminishing merely the force of the circulation, and its consequent disturbing influence upon the sanitary plastic actions of the vessels of the sac. We therefore learn to avoid the enormous abstractions of blood, formerly, and even sometimes at present, so injuriously used, from a conviction that although they control the disturbing influence of too powerful a circulation, they also, to the same or greater extent, diminish that reparative action of the vessels of the sac from which alone any permanent benefit can be reasonably expected; neither shall we have the same dread as formerly, of the slight inflammations which occasionally arise in the sac, since by them the curative action is likely to be promoted. Thus while we learn to direct our endeavours to diminish the disturbing influence of the blood current, we at the same time learn to avoid weakening the powers of the system by the use of means which induce extreme inanition."

ART. 78.—*Observations upon the Employment of Compression in Aneurism.* By O'B. BELLINGHAM, M.D. &c. &c.

(*Dublin Journal*, May 1845.)

"The subject of aneurism, since the time of Hunter, has always been one of extreme interest to surgeons, as is manifested by the numerous attempts which have been made to modify, or to simplify, the Hunterian operation. Thus, to assist union by the first intention after the operation, the two ends of the ligature were formerly sometimes cut off; or the ligature, after having been applied for a certain length of time, was removed, and the lips of the wound then brought together; or the ligature itself was discarded, and a *presse artère* applied instead to the denuded artery, and retained for a longer or shorter period, according to circumstances. But as these different proceedings were occasionally followed by unfortunate results, they came ultimately to be in a great measure discontinued, and surgeons were content to follow the Hunterian operation, adopting only such improvements as time had sanctioned. Nevertheless, the operation of placing a ligature upon a large artery was always one of considerable anxiety to the surgeon, seeing that even the most skilfully performed operations were now and then followed by secondary hemorrhage, by phlebitis,

or by gangrene; any treatment consequently which promised to do away with those risks, was a great step in advance.

"When I first brought the subject of compression in aneurism before the Surgical Society of Ireland, only three cases had occurred in which this proceeding had been employed: that number has now been increased to twelve.

Cases of Popliteal and Femoral Aneurism cured by Compression between November, 1842, *and February*, 1845.

1. Dr. Hutton.	Richmond Hospital, Dublin.	Popliteal aneurism.
2. Dr. Cusack.	Stevens's Hospital, Dublin.	Popliteal aneurism.
3. Dr. Bellingham.	St. Vincent's Hospital, Dublin.	Popliteal aneurism.
4. Mr. Liston.	University College Hospital.	Femoral aneurism.
5. Dr. Harrison.	Jervis-street Hospital, Dublin.	Popliteal aneurism.
6. Mr. Liston.	University College Hospital.	Femoral aneurism.
7. Dr. Bellingham.	St. Vincent's Hospital, Dublin.	Femoral aneurism.
8. Dr. Kirby.	Jervis-street Hospital, Dublin.	Popliteal aneurism.
9. Dr. Allen.	Royal Naval Hospital, Haslar.	Popliteal aneurism.
10. Mr. Greatrex,	Assist. Surg. Coldstream Guards.	Popliteal aneurism.
11. Dr. Cusack.	Private patient, Dublin.	Popliteal aneurism.
12. Dr. Porter.	Meath Hospital, Dublin.	Popliteal aneurism.

"Eight of these twelve cases were treated in Dublin; and in all the cure has been permanent. The aneurismal tumour in a few instances was of very large size, and in a few the operation by ligature would very probably have failed, owing to the diseased condition of the vessel, or some other cause.

"It will be observed, from the histories of the cases which have been published, that the femoral artery could be traced after the cure to near the sac of the aneurism; proving that the artery is never obliterated at the point compressed. Upon a former occasion* I endeavoured to show that such an amount of pressure as would obliterate the artery is never necessary; and a cure would be more certainly and more quickly brought about, by allowing a feeble current to pass through the sac of the aneurism, than by completely checking the circulation in the vessel.

"The principal improvement which has taken place in the treatment of aneurism by compression, consists in the mode of applying the pressure; that is, instead of employing a single instrument, we employ two or three if necessary; these are placed upon the artery leading to the aneurismal sac, and when the pressure of one becomes painful, it is relaxed, the other having been previously tightened, and by thus alternating the pressure, we can keep up continued compression for any length of time. By this means, the principal obstacle in the way of the employment of pressure has been removed; the patient can apply it with comparatively little inconvenience to himself; time will not be lost owing to the parts becoming painful or excoriated from the pressure of the pad of the instrument; and as the pressure need not be interrupted for any length of time, the duration of the treatment will be necessarily considerably abridged.

"Some of the success of the improved method of applying pressure must, however, be referred to the improvement of the instrument used. That which I employed, is a modification of a carpenter's clamp, which was invented by a patient under Dr. Harrison's care for popliteal aneurism, whom I had the opportunity of seeing several times, both while under

* Dublin Journal, vol. xxiii. p. 465.

treatment and after a cure had been effected. It consists of an arc of steel covered with leather, at one extremity of which is an oblong padded splint, the other extremity terminates in a nut, containing a quick screw, to which a pad, similar to that of a tourniquet, is attached. The principle of this instrument is exceedingly simple, so much so, that the patient can regulate its application himself, and it can be made of every size, so as to compress any vessel within the reach of compression. It appears to be a much superior instrument to that which was employed in the cases treated in the London hospitals, the application of which cannot be maintained for any length of time, without occasioning severe pain.

"ADVANTAGES OF COMPRESSION OVER THE LIGATURE.

"I propose now to enumerate some of the advantages which compression appears to possess over the ligature in the treatment of external aneurism.

"In the first place, the employment of pressure is not attended by the slightest risk to the patient. If this applied to the operation by ligature (leaving out of consideration the horror many patients have of the surgeon's knife), it might not constitute a very stringent argument with some, for deviating from what are considered established usages; but when the facts are so much the reverse, when even the most carefully performed operation for aneurism of a large artery is liable to be followed by fatal results, and when this is due, not to the increase of the disease, but to the operation performed for its relief, a mode of treatment which is exempt from all danger has obvious advantages on the score of humanity; and when this mode of treatment has proved successful in every case in which it has been carried out since its introduction, it must constitute a powerful argument in its favour over the ligature.

"Again, pressure is applicable to certain cases of aneurism to which the ligature is not, as well as to some cases in which the operation by ligature would be likely to be followed by unfavorable results. For instance, when an aneurism has attained a very large size, the long-continued pressure of the tumour must act injuriously upon the collateral circulation, compressing the veins, perhaps obliterating the arteries in its vicinity, and causing œdema of the limb below. If a ligature under such circumstances is applied, the extremity is very likely to be attacked by gangrene. This cannot happen in the treatment of aneurism by compression, which acts slowly and gradually, and can be interrupted at any time. Indeed, it appears to me that pressure would probably succeed more quickly in curing a large than a small aneurism; inasmuch as the lining of the sac of a large aneurismal tumour is generally rougher and more irregular than that of a small one; it will therefore more readily entangle the fibrine of the blood which is allowed to flow through it: moreover, in several of the examples of aneurism cured by compression, which have been published, the tumour was of a large size.

"Again, when an aneurism has attained a large size, if its contents are principally fluid, and its parietes are much thinned, inflammation and suppuration of the sac very commonly follow the application of the ligature, which may bring the patient's life into danger, and, at best, must render the recovery very tedious. This has never occurred yet after the use of compression, and such a result is evidently much less likely to follow it. Indeed, Dr. Cusack's last case of popliteal aneurism cured by compression, is an example in point; the tumour was of large size, the circumference of the limb at its seat being five and a half inches greater than on the opposite side; its parietes were so much thinned that 'great apprehensions were en-

tertained lest they should give way;' the limb was likewise œdematous; and yet everything proceeded as favorably as could have been desired, and the cure was completed within a shorter period than in several of the other cases which have been related. Mr. Liston's second case of femoral aneurism cured by compression, is also a good example; here the aneurism is stated to have been no less than sixteen inches in circumference.

"Again, aneurism not unfrequently occurs in individuals in whom the coats of the artery, between the tumour and the heart, are so much diseased that the vessel, instead of taking on the adhesive inflammation after the application of the ligature, ulcerates; or the ligature cuts its way through; or aneurism may occur in subjects labouring under valvular, or other disease of the heart. In such cases, the operation by ligature is contra-indicated, and would almost necessarily fail; whereas, pressure may be applied with the same prospect of success as in subjects in whom the heart and arteries are perfectly healthy. Indeed, in one of the earliest cases of popliteal aneurism treated by compression, since its re-introduction by Dr. Hutton, the patient was not considered a favorable subject for operation.

"Pressure is applicable to cases of the aneurismal diathesis, and when more than one aneurism exists at the same time; cases in which the operation by ligature is likewise contra-indicated; as well as to cases of spontaneous aneurism occurring in individuals of intemperate habits, or of broken-down constitution, in which the surgeon would not perform, without great reluctance, any operation. A few cases have been related in which the operation by ligature failed in consequence of some irregular distribution of the artery above the aneurism. Now, in such cases, compression promises to be equally effectual as in any other. Again, cases occasionally occur, where the patient has so much horror of a surgical operation, as to refuse to submit to it, although made acquainted with the risk of delay. Such individuals will gladly embrace any means by which they may be relieved from the necessity of undergoing an operation, and will cheerfully submit to any other method of treatment which promises a chance of cure. Indeed, it may be said to have been this accidental circumstance which led to the recent re-introduction of compression in the treatment of aneurism.

"Lastly, if pressure should fail to cure an aneurism (which, from the results hitherto observed, is very unlikely), its employment will not preclude the subsequent operation by ligature; but, by retarding the increase of the aneurism, and assisting in the establishment of the collateral circulation, it would tend rather to render the chances of the operation by ligature more favorable.

"OBJECTIONS TO THE TREATMENT OF ANEURISM BY PRESSURE ANSWERED.

"I propose now to make some observations upon the objections which have been put forward against this method of treating aneurism, since its re-introduction in Dublin, and shall endeavour to reply to them.

"It has been urged as an objection to the treatment of aneurism, by pressure, that the arteries are few in number to which this mode of treatment is applicable; but what is really the fact? The artery, above all others, in which aneurism is most frequent, after the aorta, is the popliteal, and next in frequency come the femoral and the brachial. Lisfranc has given a table of 179 cases of aneurism (exclusive of those of the aorta) collected from various works, and of this number the popliteal artery was engaged in 59 instances, while the carotid was engaged 17 times, the subclavian 16, and the external iliac only 5 times. But even this

must be much below the average, for few cases, comparatively, of operations for popliteal aneurism have been published (owing to its frequency), unless there happened to have been some peculiarity in the case; whereas most of the operations upon the iliac, subclavian, and carotid arteries have been brought before the profession, on account of the infrequency of the disease in those vessels. It must be recollected also, that aneurism of the subclavian, or carotid arteries, near their origin, and of the common iliac, or inominata, which do not admit of the application of compression, do not admit either of the employment of the ligature. It surely, therefore, ought not to be urged against this method, that, because aneurism occurs in arteries beyond its reach, we should refuse to apply it to vessels to which it is adapted; or that the practice should be denounced, because it is not applicable to every vessel.

"It has been objected to this method of treating aneurism, that the pulsation is likely to return, in consequence of the artery not being obliterated at the point to which the pressure is applied; and that the patient therefore cannot be considered safe from a relapse for a considerable period. Now, in my mind, a case of aneurism treated by pressure upon the artery above it, and according to the rules laid down, is much less likely to be followed by a return of the pulsation than one treated by the ligature, and for these reasons: the manner in which pressure brings about the cure of aneurism, appears to be very nearly that by which nature, under the most favorable circumstances, effects a spontaneous cure. The fibrine of the blood is entangled by the lining membrane of the aneurismal sac, successive depositions occur until the sac is completely filled, the tumour becomes solid, and all pulsation ceases. The sac no longer permitting the passage of blood through it, the collateral branches become enlarged, and the circulation is carried on by them. The tumour then gradually diminishes in size, owing to the absorption of its contents, and the gradual contraction of the sac, and, finally, it disappears. On the other hand, when a ligature is applied to an artery, as, for instance, to the femoral, for popliteal aneurism, the current of blood into the sac is at once intercepted; after a time, however, the blood finds its way into it by the collateral branches: now, if an anastomosis of large vessels exists between the branches of the artery above the ligature, and those between it and the aneurism, a strong current of blood will come to pass through the sac, and the pulsation will return, which cannot happen in the former case, for the reasons stated. The sac of the aneurism likewise, after the application of the ligature, not being necessarily filled by solid fibrine, but by a coagulum which may be more or less loose, pulsation is more likely to return, as the sac must contract considerably before the patient can be considered safe from a relapse; and this, from the inelastic nature of the parietes of the sac, must require, sometimes, a long time to be accomplished.

"It has been also urged as an objection to this mode of treating aneurism, that it is more tedious and more painful than the method by ligature. That it is less tedious, sometimes, several of the cases which have been published prove; indeed, in one of the last cases cured by compression, the pulsation in the aneurism ceased in a few days after the application of the two instruments; in some of the others the cure was also rapid; and if, in a few others in which this mode of treatment was adopted, a longer time elapsed, it depended probably upon the imperfection of the instrument, the irritability of the patient, or upon two compressors not having been employed together. With respect to the treatment by compression

being more painful than the operation of placing a ligature on the vessel, including the subsequent dressing, until the ligature separates, and the wound is healed, this might have been an argument against the method, when so great a degree of pressure was supposed to be necessary, as would obliterate the vessel at the part to which the instrument was applied; but the fact is, the application of the compressor (according to the rules laid down now), really relieves the pain which the aneurismal swelling occasions; after it has been applied, however, for a certain time, the pressure does cause pain, but the patient then can relax it, after having tightened the other instrument, and so continue to compress different points of the vessel for any length of time.

"It has been also urged, that the period which has intervened since the re-introduction of this method of treating aneurism is too short to allow us to conclude that the cures will be permanent. I do not know the exact length of time which is considered necessary should elapse before a cure in such a case can be pronounced permanent: two of the cases of aneurism treated by compression in this city, have remained well for upwards of two years, and two others for nearly the same period, and in none of the remaining cases has there been any tendency to, or appearance of a relapse. Now supposing, for argument sake, that the aneurism should return,—the same thing has occurred after the application of the ligature, and if there should be a relapse, would not pressure be as applicable then as in the first instance? and would not its employment be much more certain and safe than the application of the ligature a second time?

"I think, then, from what has preceded, we are warranted in concluding:—

"1st. That the arteries to which pressure is applicable, being far more frequently the subject of spontaneous aneurism than those to which it is inapplicable, compression promises to supersede the ligature in the great majority of cases.

"2d. Pressure has several obvious advantages over the ligature, being applicable to a considerable number of cases in which the ligature is contra-indicated, or inadmissible.

"3d. The treatment of aneurism by compression does not involve the slightest risk; and even if it should fail, its employment not only does not preclude the subsequent operation by ligature, but renders the chances of the operation by ligature more favorable.

"4th. Such an amount of pressure is never necessary as will cause inflammation and adhesion of the opposed surfaces of the vessel at the point compressed.

"5th. Compression should not be carried even so far as completely to intercept the circulation in the artery at the point compressed; the consolidation of the aneurism will be more certainly and more quickly brought about, and with less inconvenience to the patient, by allowing a feeble current of blood to pass through the sac of the aneurism.

"6th. Compression by means of two or more instruments, one of which is alternately relaxed, is much more effectual than by any single instrument.

"7th. Compression, according to the rules laid down here, is neither very tedious nor very painful, and can be maintained, in a great measure, by the patient himself.

"8th. An aneurism cured by compression of the artery above the tumour, according to this method, is much less likely to return than where the ligature had been employed."

ART. 79.—*Popliteal Aneurism cured by Pressure.* By Dr. ALLAN.

(*Lancet*, Jan. 18, 1845.)

This was a case of a seaman, æt. 32, the subject of aneurism in the right ham. The tumour filled the entire popliteal space, pulsating strongly, and afforded other evidence of its aneurismal character. Pressure was commenced on the 27th of July, by the use of Liston's tourniquet, which was placed upon the femoral artery, below the origin of the profunda. In a few days a second tourniquet was applied directly over the tumour. He took at the same time tartar emetic and digitalis. By the 1st of September all pulsation had ceased in the tumour, and the pressure was even removed altogether for twelve hours, without its recurrence. By the 22d of October the man was discharged cured.

[A second case, even more rapidly successful than the former, is related at the meeting of the Medico-Chirurgical Society, on Jan. 14, by Mr. Greatrex, surgeon of the Coldstream Guards. The circulation through the tumour was completely suspended, and its contents became solid on the twentieth day after the application of the tourniquet. The compression was continued nine days after this, and, in less than a month, the patient was able to walk about. A third case was communicated to the Surgical Society of Ireland by W. Newcombe, Esq., in which pressure was completely successful. The pressure was applied in the following manner]:—One clamp was applied to the femoral artery, at the lower part of Scarpa's space, sufficiently tight to diminish without completely arresting the flow of blood through the vessel. The other clamp was applied higher up the limb, but not tightened. When the pressure from the first became inconvenient, it was loosened, and the second was tightened. By thus alternating the action of the instruments, permanent pressure could be maintained. No bandage was applied to the limb or over the tumour.

Dublin Journal, March, p. 157.

ART. 80.—*Observations on Relaxed Rectum.* By HENRY HUNT, M.D.

(*Lancet*, Dec. 7, 1844.)

The author of the paper on this subject observes, that the most prominent symptoms of the affection are obstinate constipation, with tenesmus, the sensation of a load in the lower bowel, which is not relieved by an evacuation, and the discharge of a bloody mucus. The irritation frequently extends to the genito-urinary organs. On examination, the rectum is found to be preternaturally enlarged, and more or less filled with large folds of mucous membrane, which impede both the passage of the fæces and the introduction of the instruments. The consequences of mismanagement or neglect of this condition of the bowel are stated to be prolapsus ani, with irritable sphincter, and a species of intussusception of the upper and undilated part of the bowel into the lower and dilated part. The causes of the affection are habitual inattention to the calls of nature, and consequent over-distension of the gut. The treatment recommended by the author, and also by Mr. Bransby Cooper, consists in the avoidance of all aperient medicines, and the injection of a pint of cold water into the bowel every night previous to going to bed; the removal of the prolapsus, and the application of belladonna ointment to the irritable sphincter. A

practical injunction is given by Mr. Cooper, to the effect that in all diseases of the rectum, the bowels should be relieved if possible at night instead of morning; because that in the latter case, the moving about during the day tended to displace the bowel, whilst that accident is prevented by repose in bed, after passing an evacuation.

Paper read before the Medico-Chirurgical Society.

Art. 81.—*On Fungus of the Testicle.* By Professor Syme.

(*London and Edin. Month. Jour.* Jan. 1845.)

In 1808, Mr. Lawrence published a paper in the Edin. Med. and Surg. Journal, on what he called a "peculiar affection of the testis, attended with the growth of a fungus." His object in that communication was to point out a disease, which though of frequent occurrence in practice, had not been described by any surgical writer, and that castration was not necessary. "The patient has generally," says Mr. Lawrence, "assigned some blow or injury as the cause of the complaint, in other instances it has originated in hernia humoralis, and sometimes has appeared spontaneously. A painful swelling of the gland, particularly characterized by its hardness, is the first appearance of the disease. After a time, the scrotum growing gradually thinner, ulcerates; but the opening thus formed, instead of discharging matter, gives issue to a firm and generally insensible fungus. The pain abates, and the swelling subsides considerably when the scrotum has given way.

"An examination of the part while the fungus still remains, discloses the fact that the growth has its origin in the glandular substance of the testicle itself; that the coats are destroyed to a certain extent, and that a protrusion of the tubuli seminiferi takes place through the aperture. It appears that the glandular part of the testis experiences an inflammatory action in the first instance, and that the confinement of the swollen substance by the dense and unyielding tunica albuginea sufficiently explains the pain and hardness attendant on this stage of the disorder. Mr. Lawrence recommends the removal of the fungus by escharotics or ligature in preference to castration.

The examination of a portion of fungous growth, by Professor Syme and Mr. Goodsir, discovered that it consisted of two textures, sufficiently distinguishable by their colour and arrangement. One is brown and disposed in straight lines, in a diverging manner, the other is white and granular, lying in the spaces left between the diverging rays. The former is composed of the tubuli seminiferi, while the latter is simply organizable lymph effused into the interstices. A further examination disclosed the existence of a "thin layer of substance possessing the characters of a granulating surface, so that the excrescence might be regarded as merely an extreme degree of exuberant granulation." The notice of this structure suggested to Mr. Syme the idea, that by the use of proper means, the fungus might be made to retrace its steps, through absorption of the white substance, and gradual approximation of the brown, and that the granulating materials of the surface might thus be enabled to complete the healing process. Pressure was obviously the agent on which reliance should chiefly be placed for producing the effect desired, and the most convenient mode of compressing the growth seemed to be that of inclosing it within its proper covering of the scrotum.

[In exemplification of the mode of proceeding, the following case is appended]:—

Andrews Ayton, æt, 26, admitted with fungous excrescence from the testicle, the size of a filbert. On the 15th May we cut round the fungus, and extended the incision above and below, so as to give it an elliptic form. The integuments were then separated on each side, and brought over the growth, and retained by three stitches. The wound did not heal by first intention, but the fungus did not reappear.

Art. 82.—*A new Species of Suture in Wounds of the Intestines.*

By Dr. Gely, Surgeon to the Hôtel-Dieu, Nantes.

(*Medical Times*, March 15, 1845.)

To procure union in wounds of the intestines, it is necessary, 1st. That the divided bowel be placed in perfect apposition. 2d. That the opening be hermetically closed, to prevent all risk of immediate or consecutive effusion. 3d. That the ligature be tied so, that its ends can be cut close to the knot, and that the ligature shall fall into the intestinal tube. 4th. To adopt a suture easily executed, and applicable, if not to all, at least to almost every case. 5th. To be able to close immediately the wound of the abdominal parietes, so as to obtain union by the first intention, thus obviating the danger attendant on the penetration of air into the peritoneal cavity. The author considers the foregoing conditions are accomplished by the suture he now proposes, and which is performed as follows:—A silk thread, well waxed, is furnished at each extremity with a common needle, whose size is somewhat greater than that of the thread, so as to render the passage of the latter easier. One of the needles is then passed into the intestine, parallel to the wound, at about two lines outside, and behind one of its angles, and brought out after piercing the interior of the intestine about two lines from the wound; the other needle is made to perform the same manœuvre on the opposite side. The ligature is then made to cross the wound, the right needle becomes the left, and *vice versâ*. This is repeated as often as may be necessary to close the whole wound; the threads, at the spot where they cross each other are next seized with a dissecting forceps, and the edges of the wound, while the threads are gently drawn upon, must be pushed inwards, by which means the opening is hermetically shut. When all the sutures are thus tightened, the two ends must be tied, and cut off close to the knot. In order to proceed with greater rapidity, as the threads are not visible at the part where they cross each other, a knot may be made for each suture, thus avoiding the necessity of tightening them separately when the operation is terminated. Care must be taken to pierce all the coats of the intestine in a direct line (to accomplish this, the edge of the wound must be seized between the finger and thumb, and gently pressed); the stitches must be of equal length, so that both sides may correspond exactly. As the distance between the spots where the ligature enters and comes out of the intestine, is about three lines, there will be ten stitches, when the tube is completely divided, its circumference then being two inches and a half. Dr. Gely, after showing that his method is applicable to all kinds of intestinal wounds, even where there is a loss of substance, proceeds to combat the objections which may be made against it, and among them the number of times it is requisite to pass the needle through the coats of the intestine, and the liability to the formation of an obstacle to the passage of the fæces. This, though possible in

dogs and smaller animals, can hardly ever take place in man; for in estimating the normal diameter of the intestine at three quarters of an inch, and taking into account the portion of the parietes turned inwards by the muscular contraction, and the inflammatory swelling, an opening of about three or four lines will remain in the centre of the diaphragm thus formed. For many other reasons, this momentary obstruction is not so dangerous as may be supposed—the stomach is generally emptied, shortly after the accident, by repeated vomiting—the peristaltic action of the intestines is probably suspended during the inflammatory stage, and finally, the patient taking no food whatever, the intestines consequently can contain no matter. The following case is a proof of the advantage of this method:—Mathurin Magré, ætat. 16, on the 4th December, 1841, at 8 p.m., after a hearty meal, received several stabs with a knife, on the left arm, shoulder, buttock, and flank; the first three were slight, penetrating only a little below the skin; the last, on the contrary, was very dangerous, situated near the inner edge of the quadratus lumborum, about the centre of the space comprised between the last rib of the os ilium. On examination being made soon after the accident, a portion of the intestine was discovered projecting out of, and strangulated by the wound in the abdominal parietes. In this state he was brought to the Hôtel-Dieu. The projecting portion of intestine, at least 27½ inches in length (some of the students said it was three feet and a quarter) together with a portion of omentum, spread out upon the flank, was exposed to the cold air, and to friction from his dress, for about two hours; the former was distended, voluminous, highly injected, and of a violet colour, from the accumulation of venous blood. The wound having been dilated with the usual precautions, the intestine was then reduced, each portion being carefully examined before it was returned. Two wounds were now discovered in the centre of the protruded intestine. They were parallel to the circumference of the bowel, and were situated one just before the other. Their extent and position may be conceived, by supposing that the circumference of the bowel on its return was three or three and a half inches; to the extremity of the semicircle formed by each wound, the omentum was attached for a length of about four lines, and the portion of the bowel that divided each wound was ten lines in length. The opening in each wound was obliterated by a sort of hernia, formed by a protrusion of the mucous coats of the intestine, owing to the contraction of the muscular fibres of the bowel. Gas alone escaped from the wounded gut. Each wound was then united by the suture above described, the intestine replaced in the abdomen, the wound in the parietes united by strips of sticking-plaster, and prevented from re-opening by graduated compresses placed on each side, confined by a bandage round the body. Venesection was ordered as soon as the pulse became stronger, and was performed two hours after; abundant vomiting took place during the night. No consecutive accidents occurred, and twenty days afterwards the patient could eat bread without inconvenience, and soon after was as well as before the accident.

Annales de Chir. Nos. xlviii, xlix.

Art. 83.—*Treatment of Mortification.* By Sir B. Brodie.

(*Medical Times*, March 1, 1845.)

[The interest which was excited a few months back by discussion in a public journal upon the proper treatment of gangrene, renders the following remarks peculiarly worthy of recollection]:—

"When inflammation ends in mortification, you may (sometimes with the greatest advantage) employ the same treatment which you would adopt to check inflammation under other circumstances, that is, to take away blood from the arm: I have done it repeatedly with the best effects—I have done it repeatedly even when vesications have formed; and they have been checked, and so has the mortification. But there are cases in which the patient will not bear the loss of blood, and if either by this or any other means you lower the strength, instead of checking, you increase the mortification. If, then, bloodletting be sometimes advantageous, sometimes mischievous, what are the cases in which it is or is not to be employed? I can give no directions here; you must trust to practical observation, and in such cases the practical surgeon has great advantage over the scientific physiologist. If the patient be a strong, robust individual, having no symptom of weakness about him, you may take blood with advantage, and perhaps it may be necessary to repeat it several times; but if he be of a bad constitution, or a gin drinker, or one broken down by the abuse of mercury, his pulse small, weak, and very frequent, his countenance anxious, and his powers gradually failing, I say, in such a case you should not venture to take blood, but resort to another plan. You will meet with many cases where you will be able to say *here I will bleed*, and with others, *here I will not bleed;* but there are also intermediate cases where you cannot so easily decide; therefore, in such cases, if you take blood let it be done cautiously; or begin your lowering plan of treatment by diminishing the allowance of wine or other cordials; observe its effect, and then pursue the one or the other plan according to circumstances. When I speak of bloodletting in these cases, you will observe it influences also the other treatment. Where you employ bloodletting with advantage, there you may also give active purgatives, calomel and antimony, salines and antimony, and only barley-water to drink; but when bloodletting is not proper, then, in all probability, it will be requisite to support the patient by giving him ale or spirits; this refers more especially to gin-drinkers, and in such persons these will actually diminish the inflammation, as well as check the mortification. You will see the effect of this treatment in two different classes in cases of sloughing of the penis. A man has a chancre, which he has neglected; the process of mortification is going on rapidly; he has a hot skin, white tongue, and a rapid weak pulse; give such a patient wine or stimulants, and he will be worse; but bleed and purge him and you check the mortification at once. I have known cases where nature has cured the disease, while a timid surgeon was undecided whether or no he should bleed, because there was mortification going on. Perhaps in the course of the disease a large artery has been opened, and the patient has lost a pint of blood before it could be arrested, but afterwards has begun to recover immediately. Another patient comes to you in a bad state of health, with a pale, anxious countenance, and a small feeble pulse; give such a one wine and opium, and you stop the progress of the disease."

ART. 84.—*On an Easy and Certain Method of performing Catheterism, even in the most difficult cases;* Memoir read by J. G. Maisonneuve, D M.P. "In the hands of the ablest and most experienced surgeons, catheterism, in cases of retention of urine, is often a difficult, and sometimes a dangerous operation, and in those of an inexperienced surgeon, it is daily a source of serious accidents. Of late numerous methods have been proposed to facilitate this operation, and Dr. Maisonneuve proposes the following:—Introduce into

the urethra a very small gum-elastic bougie, and when it has reached the bladder, slip over it a catheter open at both ends. The passage of the latter inwards is facilitated by a bit of silk passed through it and then tied to the extremity of the bougie. To cause the catheter to penetrate easily and without pain into the bladder, it is sufficient to push it onwards on the bougie, drawing gently all the time on the silk. This method has succeeded in all the cases in which the author employed it, some of these being very difficult ones; and from these facts he concludes: 1st. That catheterism, performed in the way just described, is of all the known methods the easiest and most certain. 2d. That it succeeds wherever the other methods are applicable. 3d. That it succeeds where the others fail. 4th. That it sets aside all painful trials, all ruptures of the canal, all false passages, and all the accidents which they give rise to. 5th. That, to perform it, no peculiar skill is needed; on the contrary, it may be employed by persons not at all accustomed to such an operation. 6th. That it enables us to set aside the numerous instruments proposed to overcome the different obstacles encountered."

Medical Times, Jan. 25.

[The originality of this mode is denied by Mr. Barrington, who has witnessed its application as long as 15 years back by Dr. Hutton of the Richmond Hospital.]

Lancet, March 15, 1845, p. 300.

ART. 85.—*On a New Method of Obtaining the Obliteration of the Cavity of an Abscess lined with a Pyogenic Membrane.* "Dr. Moreau Bontard, of Versailles, in a case of chronic abscess of the buttocks, complicated with a very minute fistulous opening, employed the following subcutaneous method, which may be considered as a modification of the mode of scarification of the tunica vaginalis employed by Professor Velpeau in hydrocele. The patient was placed on the right side, the left lower extremity was bent so as to make the abscess as prominent as possible: it was then opened with a sharp bistoury near one of its borders. In the opening a probe-pointed bistoury was introduced, the blade near the handle being previously covered with a bit of linen to avoid jagging the aperture, and six scarifications were made, all converging towards the same spot, three on the pseudo-membrane corresponding to the deep-seated parts, and three on that lining the integuments. The bistoury was now removed, and by gentle pressure the cavity was completely emptied of the pus, mucus, and blood it contained, and the admission of air carefully guarded against. A bandage was then applied, cold fomentations were prescribed, and the patient was ordered to remain quiet. This plan was persevered in for three days, when the cure was completed, without fever or any other unpleasant symptom having made its appearance. An effusion of plastic lymph had taken place into the cavity of the abscess, which by causing adhesion of its sides, had obliterated the sac. Absorption of the surrounding textures had also taken place, for, on pressure being made over the former site of the abscess, which pressure was not productive of pain, no *engorgement* nor induration could be discovered on the eighth day after the operation."

Bulletin de Thérapeutique, and *Medical Times*, March 22, 1845.

ART. 86.—*Extirpation of the Os Coccygis for Neuralgia.* A lady, aged 25, had been suffering from derangement of her general health and neuralgia for ten months before she came under Dr. Nott's care, at which time her condition was deplorable.

Suspecting that disease or displacement of the os coccygis had become a source of irritation to one or more nerves in its vicinity, Dr. Nott made an examination of the whole spine, and found no tenderness until his finger touched the point of the os coccygis, when the patient screamed with pain. He proposed extirpation of the bone, to which the patient assenting, it was performed as follows:—An incision was made down to the bone, extending from its point two inches upwards; the bone was then disarticulated at the second joint, the muscular and ligamentous attachments divided, and the two terminating bones were dissected out without much difficulty. The last one was found to be carious and hollowed out to a mere shell; the nerves were exquisitely sensitive. The operation, though short, was attended with extreme suffering. For several hours afterwards, the pain was extremely violent, coming on every ten or fifteen minutes, and accompanied by a sensation of bearing down, like labour-pains. Morphia, in large doses, and other anodynes, afforded no relief; the pains became gradually less frequent and violent, the wound healed, and at the end of a month the local disease disappeared, and the general health was much improved.

At the next catamenial period, or shortly afterwards, she was attacked with very severe pain, referred to the vagina, uterus, and back, which continued for about four days; on examination, several points of the vagina were found to be exquisitely tender to the touch. Under the use of the citrate of iron, in doses of five grains three times a day, continued for two months, the patient ultimately recovered perfectly, and at the date of the report had been three months without any relapse.

American Journal of Medical Sciences, and *Dublin Medical Press*, Jan. 15th.

Art. 87.—*On the Treatment to be pursued in the Admission of Air into the Veins.* The plan here mentioned is one given in a monograph by Dr. Wattman, upon the subject of the admission of air into the veins, and is said by the author to be a certain means of preventing the fatal consequences.

The plan consists in the instant closure of the orifice in the vein by the finger, and dashing cold water into the face, if the patient has already experienced symptoms of delirium. The permanent closure of the vein is to be effected, either by gently closing and uniting the lips of the wound, or by ligature or torsion.

American Journal of Medical Sciences, Jan. 1845, p. 173.

Art. 88.—*On the Treatment of Venereal Diseases.* By Mr. Carmichael.

(*Medical Times*, April 1845.)

The following remarks are a resumè of Mr. Carmichael's opinions:—1st. He does not think mercury necessary in the treatment of the simple primary ulcer without induration, nor for the papular eruption, and other constitutional symptoms it produces; but should the eruption linger into the fourth or fifth week after it has desquamated into scaly spots or blotches, mercury in alterative doses, either in the form of Plummer's pill or the proto-ioduret of mercury, will be of service in clearing the skin of the eruption, and in removing the pains of the joints, which are constantly present in this form of venereal. It should never be employed at the period when the eruption first appears in its papular form, at a time that is usually preceded and accompanied by considerable fever, like all the other exanthemata, to which class of Cullen it obviously belongs. If mercury is exhibited prematurely during the eruptive stage of this as well as the other

forms of disease, the scaly excepted, the skin may be cleared of the eruption, but in all probability it will return again and again to the great disappointment of the patient, and perplexity of the medical attendant. 2d. Mercury should be given in iritis, so as to excite its full effect upon the system; the usual antiphlogistic measures to remove this dangerous inflammation are not to be neglected. 3d. Mercury is to be given for the removal of nodes, for which purpose the iodide of that mineral is superior to any other preparation. 4th. In phagedenic primary ulcers mercury is always most injurious. They are most successfully treated by the application of strong nitric acid, immediately followed by a douche of cold water. The same application is also the most efficient for phagedenic ulceration of the throat, which, if not checked, will soon extend over the velum, uvula, and back of the pharynx, from whence it will spread upwards into the nares, and downwards into the larynx. Instead of the douche of cold water, in this situation inadmissible, a probang must be used, the sponge of which, moistened in a solution of soda or potash, will neutralize any superabundant acid applied to the ulcers. During the eruption of pustules or tubercles, which cause those crusts termed rupia, mercury is decidedly injurious, although its exhibition may at first flatter both patient and surgeon, that the disease is yielding to this remedy. But the natural tendency of this eruption is also to become scaly after it has existed several weeks or months. This scaliness is a sign that the disease is on the decline, and indicates that mercury in alterative doses may then be employed with safety and advantage. Should any of the constitutional ulcers on the skin spread after the rupia crusts fall off, their progress may also be effectually checked by the application of nitric acid to their phagedenic margins. They of themselves first show signs of healthy reparation in their centres, which need not therefore be meddled with. Mercury, in this stage of the disease, should not be exhibited. Hydriodate of potash, sarsaparilla, country air, and the tranquillizing effects of opium, should the patient be harassed by extensive ulceration, are the constitutional means most to be relied upon. 5th. For the true Hunterian chancre with hardened edge and base, and for the scaly eruption which attends it, as well as the deep excavated ulcer of the tonsil, nodes, and other symptoms belonging to this form of disease, mercury may be esteemed a certain and expeditious remedy.

Art. 89.—*On a Simple Means of Arresting Bleeding from Leech Bites.* The troublesome and occasionally fatal effects of hemorrhage from leech bites, especially in children, has led to a great number of devices for the purpose of arresting the bleeding. Mr. Gosset recommends the following plan, which, from its extreme simplicity, is worthy of universal publicity. "After wiping away the blood he applies quickly a piece of visiting card, cut into a circular form about the size of a silver penny, the glazed side being applied to the wound. This must be pressed firmly into the wound, and held there about a minute; it will then become firmly glued to the part and effectually restrain further hemorrhage." In this way Mr. Gosset has continually arrested hemorrhages which had resisted caustic, acetic acid, &c.

Lancet, Nov. 9, 1844.

Art. 90.—*On the Possibility of Diminishing the Volume of Herniæ, and aiding their Reduction by Internal Treatment.*

By M. Dieffenbach, Professor in the University of Berlin.

(*Gazette des Hôpitaux*, No. 10. *Encyclographie des Sciences Médicales*, Fev. 1845, p. 212.)

"It is possible, even in many cases in which the taxis has failed, to procure a most advantageous result by internal treatment. This treatment consists essentially in causing the patient to maintain the recumbent posture for a long period, instituting at the same time a certain dietetico-pharmaceutic regime. The number of cases in which the author has been successful is surprising. Those who, in consequence of the immense size of their hernia, were unable to wear a truss, have by this means had the volume of the tumour so much reduced as to render the application of that instrument both safe and efficacious. M. Dieffenbach commences the treatment by confining the patient *bonâ fide* to bed; he will not allow anything short of this, for if the patient be permitted to recline on a sofa in his day costume, or to sit up in bed even, the beneficial effects of the plan are entirely done away with. The patient then takes, morning and night, Pullna water in doses sufficient to ensure watery stools. It is, however, of importance not to persevere too long in drastic purgatives, but to vary them by the occasional substitution of the compound rhubarb pill. Eventually he gives nothing more powerful than castor oil.

"During the whole of this treatment, food either of a very nutritious or indigestible character must be carefully interdicted. Indeed, the aliment should always be given in the form of broth. The tumour should at the same time be submitted to local treatment, varying it according to the nature of its contents. If the hernia contains only intestine, and there is no adhesion, cold compresses are indicated; if, on the contrary, omentum forms part of the tumour, warm fomentations will be more suitable.

"By these means, M. Dieffenbach states that he has frequently seen the most voluminous hernial tumours diminished by half in the space of eight days."

Art. 91.—*On the Operation of Tracheotomy.*

By Robert Liston, F.R.S., Senior Surgeon to University College Hospital.

(*Condensed from the Lancet*, Nov. 1844.)

The trachea requires to be opened for the extraction of foreign bodies. In this case no time is to be lost, as fatal symptoms may arise at a moment's notice. If the foreign body is loose, it will sometimes fall out by itself as soon as the opening into the trachea is made. At other times, they will not come away for a day or two after the operation. If it be situated above the opening, it may sometimes be disentangled and extracted by a bent probe. It is usually, however, found below; in this case, after having ascertained its exact situation by the probe, it must be extracted by the forceps.

Tracheotomy is also necessary on account of acute disease. Sometimes, in cases of *scalded glottis*, the symptoms become so alarming as to render the operation indispensable. It is occasionally also required, in consequence of wounds in the neck, where suffocation is threatened in consequence of extravasation into the tissues. *Œdema of the glottis* is another affection which sometimes imperatively calls for the operation. In

all these cases, we must not wait until death is imminent before we open the trachea, but do so while the lungs and head are as yet unaffected. In some cases of ulceration of the larynx, an opening is made in order to enable the patient to breathe more freely, and to give the ulcers time to heal. The latter indication may be promoted, by touching the diseased part with a solution of lunar caustic.

In *acute laryngitis*, if the disease be confined to the larynx, it may be necessary to open the trachea. In *croup* no benefit will ensue from the operation, because the trachea, and even the ramifications of the bronchi, are involved in the disease. We are not justified in having recourse to it in the first instance; and after effusion of lymph has taken place, no good can be expected from the proceeding.

When the operation is decided upon, it becomes a question whether the larynx or the trachea is to be opened; under some circumstances cutting into the crico-thyroid membrane will answer the purpose. In cases where there is obstruction at the rima glottidis, as where swelling has followed a scalding of the parts, the high operation may answer; and in cases where a foreign body is lodged in the ventricle of the larynx, an opening in the crico-thyroid membrane may suffice, and in that case should be preferred, as being more simple than tracheotomy. It may be accomplished with any pointed instrument, as a penknife, and without any great incision. This operation will also answer exceedingly well in cases of suffocation caused by the impaction of a foreign body in the œsophagus, and many persons have been thus saved. But in the majority of cases tracheotomy is to be preferred, whether it be impaction of a foreign body in the lower part of the trachea, or in cases of œdema and other diseases of the glottis; for by this operation you get a free opening, and one at some distance from the seat of the disease, which is a point of some importance.

The operation itself is not attended with much danger, as the incision to the windpipe can be made without involving any vessel of consequence. There are sometimes large arterial branches running across the windpipe, but not often; the chief obstacle is the presence of the thyroidal veins. The wound heals with great rapidity; too fast indeed in some cases; for when the operation has been performed for the extraction of a foreign body, blood will sometimes be extravasated, or drop into the trachea and cause suffocation. The best plan, therefore, is to put a bit of lint between the edges of the wound, and cover its surface with a pledget dipped in cold water and frequently renewed. After the incision has been made six or eight hours, the edges may then be brought together, and will speedily unite.

There is little difficulty in getting down to the windpipe in an adult patient, if he is steady, and willing, as they generally are, to be relieved from impending suffocation. The patient is placed in a chair, and an assistant bending back the head, an incision is made from the top of the sternum upwards towards the cricoid cartilage, fully an inch in length, and going through the skin and subjacent tissue. You expose at once the sternohyoid muscles, and cut through them, the veins and the isthmus of the thyroid body are then pushed on one side, and a clear space is thus exposed for making the opening into the trachea. The patient is then to be desired to swallow his saliva, and while the windpipe is raised by this act, the knife is to be pushed into it, and two or three rings to be cut across. If this has been done in consequence of the presence of a foreign body, this will generally fly out the moment the incision is made, and in

consequence of the relief to the respiration and the cessation of struggling, the bleeding, principally venous, will cease of itself. Should it happen, however, that there is hemorrhage from an arterial vessel, it must be secured. In cases of permanent or long continued obstruction at the top of the windpipe, it will be necessary to introduce a tube. There is no sound objection to this instrument. Mr. Liston states that he has tried it more than twenty times, and that it does not cause irritation. He condemns the curved canula and trochar as unsurgical.

The operation is far more difficult in children than in the adult, as the neck is shorter and more laden with fat. The patient, if a child, must be well secured, and the operation is then to be performed as above described, with this exception, that as we cannot get the child to swallow its saliva, the larynx must be raised by a sharp hook. The time for which it is necessary to wear the canula varies according to the nature of the disease for which the operation is performed, the only precautions necessary, in connexion with it, are to keep it clean, and to cover the orifice with some loose texture, to prevent the admission of cold air.

[In a late number of the *Medical Gazette*, Mr. Cock speaks in very favorable terms of the curved canula and trochar in the operation of opening the trachea. Its principal advantages over the ordinary method, as stated by him, are a saving of time, which in some cases is a matter of great consequence; and the power it gives to the medical attendant of dispensing with assistance. The method of using the instrument, is first to cut boldly down to the larynx, and then to introduce it as in the ordinary operation for hydrocele, the concavity of the instrument of course looking downwards.]

SECT. IV. RARE SURGICAL CASES.

Art. 92.—*Complete Dislocation of the Tibia forwards, produced by Simple Extension.* By Dr. Felix Jacquot, of St. Die.

(*Archives Générales*, April 1845, p. 475.)

A serjeant, 21 years of age, of robust habit, entered the Military Hospital of Instruction at Metz, July 23d, 1844. Half an hour afterwards he met with the following accident:—Making a long jump of nearly four yards, upon a flat surface, he fell, contrary to the gymnastic laws, upon the left foot, the leg extended and directed backwards, whilst the right leg, being in advance, did not reach the ground. He experienced violent pain, and fell forwards upon his belly. A dislocation of the tibia forwards had occurred; this was evident, on simple inspection, from the very marked characteristics of such an accident. It is absolutely impossible to confound it, when recent, with any other lesion.

The thigh formed an obtuse angle with the femoro-tibial articulation, so that the axis of the leg was placed considerably in advance of the axis of the thigh. The superior surface of the tibia was covered by the patella, the subcutaneous surface of which presented forwards and upwards. The condyles of the femur were felt in the popliteal space under the distended skin; but the pulsation of the artery was not felt so superficially as usually described; it was obscured in the space between the condyles. The triceps projected, and the tendons of the crural muscles, inserted internally and externally into the tibia and fibula, were stretched, and formed two bent

cords, posterior to the concavity. The limb was very mobile, flexed easily, and without pain; extension was more difficult, and attended with some pain. The foot turned inwards or outwards, according to the position given to the limb. The shortening did not exceed one inch and a quarter.

A swelling, scarcely perceptible, existed at each extremity of the transverse diameter of the knee. The patient suffered very little. No ecchymosis could be perceived, and M. Jacquot was inclined to think that if anything was ruptured, it must be the crucial ligaments, and some fibres of the gastrocnemic muscles; it was evident that the tendons were intact.

Extension was made, and the limb being stretched moderately by three individuals, in a few seconds the reduction was effected. A fracture extension bandage was employed for 20 days, removing it occasionally, when flexion was effected without difficulty by the surgeon, but not by the patient without the assistance of his hands. There was slight swelling the first few days which then subsided. No pain in the knee but pain in the sole of the foot and along the tendo-achilles, particularly at its insertion. This pain lasted a long period, was at times very intense, and did not appear to be caused altogether by the apparatus. When the apparatus was removed, the patient could very partially bend his leg, but, by degrees, the power of voluntary motion returned, and by the 30th of August the power of flexion was, to a great extent, recovered, and he could limp about 20 paces without assistance. The left knee was at this time still somewhat enlarged. On the 3d of September he walked without limping, experiencing only towards the evening rather more than usual fatigue.

M. Jacquot remarks that Velpeau and others deny that a dislocation of the knee can be produced by flexion or extension alone, and that this case tends to invalidate that opinion.

He gives a complicated theoretical explanation of the manner in which this happened, but the simple view of the case taken by the editor of the "Archives" is doubtless the true one. "There was not only extension of the leg, but also a rapid fall of the body towards the earth; that is to say, a force which tended to slip the condyles of the femur over the articulating surface of the tibia. It appears to us that the combination of two forces tending to produce the extension of the leg and the rapid fall of the femur downwards, might very easily produce a dislocation of the tibia forwards.

ART. 93.—*Gangræna Penis and Fistula Urinaria, produced by external Violence of a peculiar nature.* By Professor MÖLLER, of Elsingore.

(*Bibliothek für Læger*, 1844.)

J. A., a Prussian sailor, apparently of a phlegmatic temperament, was brought to the Royal Hospital, on the 22d of April, where he gave the following statement:—Eight days previously he had fallen upon a handspike, thereby receiving a severe contusion in the region of the pubes. The pain from the penis to the umbilicus was very intense. Considerable swelling of the abdomen and penis, with discoloration of the latter, supervened, with thirst, bitter taste in the mouth, and restlessness. The bowels had been well opened the night before, some blood had however passed, together with the fecal matter. He believed that he had passed no urine lately. Much debilitated by his sufferings, and of a dull and stupid nature, his explanation was exceedingly unsatisfactory. Upon investigation, the skin of the erect and much swollen penis was found to be black and hard, in a state of sphacelus. On the glans, several ulcers, painful to the touch, were seen.

The skin around the root of the penis was also hardened and discolored. On the lower part of the abdomen, a hard, somewhat elastic, tumour, reaching from the symphisis pubis to the navel, was observed. Pain only produced by a considerable pressure upon the abdomen. Pulse small, 75. Tongue yellowish. Thirst and want of sleep. By means of the catheter, about two quarts of urine, deeply tinged with blood, were evacuated. No difficulty in passing the instrument was experienced. The tumour, after evacuating the bladder, was immediately lessened, the pain diminished, and the patient soon fell into a deep sleep. Twenty leeches applied to the region of the bladder, with warm fomentations.

April 23. In removing the necrotised skin and cellular tissue, a deep suppurating wound upon the inferior side of the penis, anteriorly to the scrotum, was laid bare. In this, a hard body, subsequently discovered to be a ring of metal, was found, completely surrounding the root of the penis. With some difficulty this ring was removed by means of a fine elastic saw, and, as it was one of that description usually employed to string keys upon, in which the extremities are not united together, the affair was soon over. At one spot the ring was deeply hacked, in all probability by the patient himself, during his endeavours to get rid of it. Through a perforation in the bulbous portion of the urethra, flowed urine, mixed with blood and some matter. Rather more than a pint of urine was drawn off by the catheter. Patient low, depressed. Pulse small and quick. ℞ Ammon. carb., gr. v; opii puri, gr. j; sacchari albi, gr. xv; M. ft. pulvis, 4 horis.

April 24. Patient had enjoyed no sleep. Continued fever. Pulse 96, rather full. Considerable tension of the belly. No urine having been voided, an elastic catheter was passed, through which two quarts of urine, slightly mixed with blood and pus, were extracted. Some pain was caused in introducing the instrument through the pars prostatica, although it passed easily. Excepting the small quantity of bloody pus above mentioned, the urine was clear, and without any abnormal scent. The pains in the penis less severe, and the glans presented a clean suppurating wound. Another portion of the necrotised skin and cellular tissue removed. The patient being costive, a solution of Epsom salts was administered.

April 26. Fever increased. Tongue parched, dry. Great thirst. Urine had been evacuated twice a day, by means of the catheter. Ordered, Mist. acida mineralis, a tablespoonful every second hour.

April 27. The remainder of the hardened skin removed. Pains in the penis slight. Urine continued to be passed through the catheter. General condition about the same.

April 28. Clean suppurating wound. No sleep during the last night. A considerable quantity of urine with bloody pus had flown through the wound in the urethra. Pulse 120, small. Scrotum excoriated by the urine. Ordered, Ceratum simplex, and emollient poultices.

April 29. Great thirst. Diarrhœa of greenish colour. Pulse 130, small. Ordered wine.

April 30, *evening*. Diarrhœa had ceased. Oppression in the cardia, hiccough, debility, pain near the anus. Pulse 140, irregular. ℞ Acid. hydrochl. diluti, ʒiss; aquæ puræ, ℥vj; syrupi diacodii, ʒvj; d. ℥j, every hour.

August 1. Vomiting. Diarrhœa, in which a lumbricus passed. Restlessness. Hiccough. Low and irregular pulse. Wound in the penis dry, yet covered with granulations of a healthy appearance.

August 2. Night passed in much pain and distress. Hiccough. Vomiting of a stinking fluid. Great debility. Collapsed countenance. Cold extremities. Meteorismus. Granulations had assumed a blueish colour. Pulse 150, very irregular. Consciousness remained to the last. A pint of thick, reddish, stinking urine, mixed with matter, was drawn off through the catheter. Shortly before two p.m. he died, taking with him to the grave, the secret whether he himself or another had placed the ring where found. Although often questioned concerning this, he continued firm to his first statement, viz., that he knew nothing about the ring.

Sectio cadaveris, twenty hours after death:

1. In the urethra, a large ulcer, about four and a half inches from the orifice.

2. In the abdomen, much urine, mixed with matter. The fundus and a considerable portion of the corpus vesicæ were in close adherence to the parts around, with great alteration of structure and consistence, almost gangrenous. On the cervix vesicæ were two small openings, with rounded margins. Several small holes in the fundus seemed rather produced in the attempts to separate the bladder from the other parts, to which it had become so closely attached. On the external lining of the intestines was seen a considerable exudation of plastic lymph, in some places almost amounting to pseudo-membranous consistency. A little matter was also seen, but in no place amounting to a larger depôt. The ileum, on the side opposed to the insertion of the mesenterium, was slightly injected. Other organs in the abdomen and chest, in a healthy condition.

Art. 94.—*Remarkable Case of Injury to the Brain.* By Dr. O'Callaghan.

(*Dublin Medical Press*, Feb. 1845, p. 82.)

This case, which is perfectly authentic, and one of the most remarkable on record, occurred in the person of an officer in the Ceylon Rifle Brigade. The case was one of accidental bursting of a fowling-piece, which inflicted a deep and severe wound in the forehead, immediately above the nose. The patient was knocked down by the explosion, but immediately recovered his feet, and walked to a neighbouring cottage with assistance. When seen by his surgeon, the wound was circular, and continually discharged a bloody serum, mixed with pus. Pus, as well as fragments of bone, likewise passed from the nostrils. The patient recovered under the most simple treatment.

The officer soon after this returned to his duty, but in a few months was much incommoded by a metallic substance which began to protrude through the palate, accompanied by the most offensive discharge, which, however, he was unconscious of, as the sense of smell had been entirely destroyed by the accident. In four months' time, the metallic body had protruded so far that an attempt was made to extract it, but was not persisted in on account of the excessive agony of the operation. Things remained much in the same state until the next year, when the patient died from imprudence in drinking. On examining the head after death, the *whole of the iron breech of a gun, with the screw attached, were found lodged in the forehead.* The weight of this mass of iron, which had so long remained quiet in its extraordinary situation, was near 3 oz.

Art. 95.—*Luxation backwards of the Axis on the Atlas.*

By M. Hirigoyen.

(*Bulletin Méd. de Bordeaux*, and *Med. Times*, Jan. 11, 1845.)

"Two cases only have as yet been recorded of this affection; one by J. L. Petit, the other by Sir Charles Bell. The present case presents, therefore, some interest: John Dumé, æt. 60, was brought at eight p.m. to the Hospital Saint André, Bordeaux. This man, by trade a mason, while on a scaffolding about fifteen feet from the ground, lost his equilibrium, and fell on his head on some sand. When examined immediately after by M. Chaumet, chief surgeon of the hospital, and M. Hirigoyen, his state was as follows:—deep coma, eyes shut, no deviation of the features, respiration quiet, though somewhat weak and slow; pulse very weak, 58; muscles flabby, and not contracted; no blood had flowed from the ears and nose; no wound or contusion; vertebral column straight; slight excoriation of the skin on the inside of the right carpo-radial articulation; head thrown backwards, though not more so than that of a corpse when placed in a horizontal position; as mobile as when uninjured. These symptoms seemed to indicate cerebral concussion, consequently sinapasms were ordered to be put on the lower extremities; purgative enemata to be employed, and blood to be drawn if the pulse became stronger; but all was useless; the intensity of the symptoms did not decrease in the least and the patient breathed his last the night following the accident. *Post-mortem* examination: Impressed with the idea that the man had died from cerebral concussion, the skull was carefully removed, but no effusion of blood, nor any other lesion of the brain, could be discovered, and it was only on taking this viscus out of the cranium that the cause of death was perceived. The medulla oblongata was pushed backwards, and somewhat flattened against the posterior portion of the atlas, on a level with the lower third of the corpora pyramidalia; the inferior portion of the brain, the cerebellum, and the pons varolii, presented no lesion; through the spinal dura mater, a blueish tint was perceptible anteriorly, produced by an effusion of blood between that membrane and the vertebræ; and a considerable eminence, the cause of the flattening of the medulla oblongata, was discovered. When the dura mater was divided, the eminence was found to be formed of the odontoid process, placed behind the transverse ligament, somewhat more to the left than the right; right odontoidian ligament entire, whilst the left was torn near the processus dentatus; the former crossing the transverse ligament, and preventing the apophysis from rising above it, or pressing the medulla to a greater extent; the articular surfaces were separated from each other; no fracture; nothing abnormal in any other of the viscera."

Art. 96.—*Fracture of the Costal Cartilages, and Rupture of the Vena Cava.*

By Rich. Pyper, Esq., Assistant-Surgeon 11th (Prince Albert's) Hussars.

(*Lancet*, Oct. 1844.)

"H. P——, aged 25, a driver in the Royal Horse Artillery, on the 21st of June, 1844, was thrown from his horse, and two of the wheels of the gun-carriage passed over the body. When I saw him, about two minutes after the accident, he was lying on his left side, with his body in a bent position, using violent convulsive motions of the upper and lower extremi-

ties. The respiration was difficult and oppressed, and the countenance pallid. The pulse was quite imperceptible at the wrist, and the heart's action scarcely audible: he was insensible. I had him immediately moved to a short distance out of the way of the guns, and whilst being removed, the muscles of his trunk and extremities became completely rigid and fixed, as if all the voluntary muscles were affected by tonic spasm; there was no mark of injury of the head. From the nature of the accident and the symptoms above detailed, it struck me that some internal viscus was injured, and that consequent extravasation of blood was taking place; so, to give the poor fellow what I conceived to be his only chance, I opened the jugular vein, which at first bled pretty freely, and for a time his breathing appeared more tranquil and easy; but the muscles became quite relaxed, and the heart's action gradually slower, till it entirely ceased, and he died in about ten minutes from the time I first saw him. He lost about three ounces of blood from the jugular vein.

"*Examination of the body twenty hours after death.* There was no external mark of bruise or injury on any part of the body. On removing the integuments, a considerable quantity of blood was found effused under and at the lower border of the great pectoral muscle on the right side, and on removing the muscular parts, there was presented on the same side a fracture of the cartilages of the sixth, seventh, and eighth ribs. The cartilage of the sixth rib was fractured about half an inch from its costal articulation, and the cartilages of the seventh and eighth ribs, which are naturally united together, were fractured about midway between the ends of those ribs and the sternum. The ribs themselves were uninjured, The sternum was fractured just below its articulation with the cartilage of the fifth rib; and the lower portion of sternum, together with the portions of the cartilages of the sixth and seventh ribs attached to it, were very little, if at all depressed; in fact, the fascia covering the sternum anteriorly was quite free from laceration, but the costal pleura was found ruptured beneath the situation of the fractured cartilages. On opening the cavity of the thorax, the whole anterior portion of the lower lobe of the right lung presented a dark livid appearance, and was greatly congested with blood. All the other parts of lungs were quite free from injury. About two ounces of coagulated blood were found in the right pleural cavity, which appeared to come from that effused under the great pectoral muscle, for the pleura covering the bruised portion of lung was in no place lacerated. On opening the pericardium, it was found filled with fluid blood, which came from a laceration in the ascending vena cava, extending from the internal surface of the pericardium to the right auricle of the heart; the pericardium was not injured in the least, but greatly distended with the blood it contained. The heart was small and extremely hard, and all its cavities were contracted and quite empty. The liver was uninjured and the gall-bladder empty. The spleen was ruptured on its convex surface, and about an ounce of blood was effused into the abdominal cavity. All the other viscera were uninjured.

"*Remarks.* The rupture of the vena cava might, in this instance, have been produced by a violent contraction of the heart suddenly arresting the return of blood to the right auricle, at the same time that the vein was being obstructed lower down. The vein was ruptured longitudinally, and in that situation it is well protected anteriorly by the lower lobe of the right lung and pericardium; and although that portion of the lung was very much bruised, yet the pericardium was quite uninjured; also the empty state of the heart's cavities, and the contracted state of muscle itself, pointed out some unusu-

ally strong action of that organ previous to death. However, the immense force which must have been applied to cause a fracture of the yielding cartilages, might have been sufficient of itself to have ruptured the vein when distended, though the fractured portion of sternum was very little, if at all depressed; for Cruveilhier states (*Anatomie Descriptive,*) that "La flexibilité des côtes et de leurs cartilages permettant une forte dépression sans fracture du sternum, on s'explique la possibilité de contusions et même de *déchirures* du cœur, des poumons, *des gros vaisseaux*, sans fracture des os du thorax." Moreover, the great distensibility of the vein would lead one to doubt very much the possibility of its being ruptured by the heart's action *alone*.

The possibility of the cartilages of the ribs being fractured without previous ossification I find denied by Boyer; however, Mr. S. Cooper, in his *First Lines on Surgery*, states that "the cartilages in their natural state are sometimes ruptured." And this case fully bears out that opinion; for although I found a few points of ossific deposit on the cartilages, and these situated chiefly at their costal articulation, yet the places where the cartilages were fractured were quite translucent, and perfectly free from ossific matter.

"This case is also interesting in pointing out the great extent of injury which may take place to internal organs without any external indication; for though there was fracture of the sternum, and of the cartilages of three ribs on the right side, yet so little was the displacement, that the fracture was not discovered until the integuments were removed, though a careful examination was made previously. Also there was considerable extravasation of blood under the great pectoral muscle; yet the injury which caused this produced no marks of bruise on the corresponding integuments: perhaps the great outlet for the blood, (viz. the fissure in the vena cava,) and the short time that elapsed between the receipt of the injury and the death of the patient, might in some way account for this want of bruise."

Art. 97.—*Rupture of the Rectus Femoris.* Mr. G. S——, after running some distance from a sudden trip of the foot, fell to the ground. He heard a loud snap just above the knee-pan, and nearly fainted from the excessive pain. By soothing treatment he recovered from the severity of the injury. On examining the case six weeks afterwards, there was a very large swelling from the rectus femoris muscle, drawn one third up the thigh, and a corresponding depression above the patella. Walking caused great pain in the thigh. There was no tendency to approximation of the divided cords by an intervening ligamentous substance, and the surgeon (Mr. Grantham) was unable to effect any good by position or pressure. This gentleman remarks, that probably the rupture was near the muscular bands, and if so, the case militates against a proposal which has been made to divide the tendon in the cure of talipes, near to the fleshy or muscular part.

Facts and Observations in Medicine and Surgery. By John Grantham, F.R.C.S.E.

Art. 98.—*Recovery from Severe Injury of the Chest.* Mr. Grantham gives a case of perfect recovery from the effects of a gunshot-wound in which the shot traversed the seventh rib, and caused a compound comminuted fracture, followed by the loss of seven inches of the bone. The cutaneous, subcutaneous, muscular, and ligamentous structures connected with the pleura costalis were lacerated, inflamed, and ulcerated, without

any pectoral affection, and recovery took place, as the author believes, without any adhesion of the two surfaces of the pleura. The case is given in illustration of the amazing extent of protection afforded by the pleura to the lung, and of Bichat's principle that the serous membranes contribute to the independence of the vital powers and functions of different parts, by separating the respective organs.

Lib. cit.

PART III.

MIDWIFERY, AND THE DISEASES OF WOMEN AND CHILDREN.

ART. 99.—*On the Moral and Intellectual Requirements of the Obstetrical Practitioner.* By Dr. BEATTY, Professor of Midwifery, Ireland.

(*Dublin Journal*, March 1845, p. 120.)

[ALTHOUGH the following remarks cannot be strictly called practical in the sense in which that word is generally employed, we think them so replete with sound and wholesome morality, as well as good feeling, that we gladly avail ourselves of them as a preface to our first retrospective labours in the department to which they refer. They form a portion of an address read before the Royal College of Surgeons of Ireland, and are reproduced with few exceptions in the exact words of the lecturer.]

"Without going here into detail, let me call for attention to what is requisite for the practitioner in this branch of medicine. Passing by the intricate diseases of infancy and childhood, let us pause for a moment on that wide and difficult class of derangements of female health which commence with puberty. This is a season which properly calls forth the anxious solicitude of every mother; and it too often happens that neglect or mismanagement at this period lays the foundation of long enduring or permanent infirmity. Here it is that a judicious exercise of professional skill is required, and an acute or delicate tact is essential to discriminate between the diseases which may exist, and to administer the remedies appropriate to each; for in no class of cases is more mischief caused by following a routine practice than in that to which I have just alluded.

In a more advanced stage of female life, the practitioner of our art has to encounter a most formidable class of diseases, the organic affections of the womb. These are frequently rendered formidable by concealment in their early stages, arising out of the natural delicacy of the female character, and the repugnance they feel to disclose their sufferings. But in this case much may depend upon the previous character and conduct of the attendant. If by his skill and kindness on former occasions, he has gained the respect and confidence of the patient or her friends, she will communicate her ailments to him at a much earlier period than she would under other circumstances; and thus a disease may be discovered and checked at its commencement, which, if allowed to proceed, would assume a most dangerous form.

There is still another highly important, and often most difficult subject, upon which the accoucheur is required to be well informed, as questions of

the highest moment arising out of it are frequently proposed to him, and upon his decision consequences of the most grave nature may depend. I allude to the subject of pregnancy,—one requiring a combination of learning, experience, and tact, in a higher degree than almost any other subject in medicine.

Such are some of the duties required of the practitioner in midwifery; let me call your attention to the qualifications essential to their due fulfilment. Anatomy and physiology, the grand foundation on which all medical knowledge is based, must be well and thoroughly understood; and the principles and practice of medicine and surgery must be deeply engraved on the mind. A liberal and comprehensive medical education is, therefore, the first essential qualification for midwifery practice, and, without it, it is impossible for any man to rise to eminence.

Let us now suppose his term of study complete, is there any other qualification necessary to enable the student to become a practitioner, and to secure a share of public confidence? There are many. In the first place he must have a good moral character. Morality founded on religious principles before all other; but if unhappily such a regulator should not abide in him, then morality conformable to the strictest rules of society. In all branches of the profession, a failure in this particular is most detrimental; but in that to which we belong, a pure and unspotted character is the ingredient most essential to success. It matters not what amount of ability may be brought to the task; if it be not accompanied with strict moral rectitude, the door of public favour will be closed against them. Another very important ingredient is a good temper, or a steady control over a bad one. It is necessary to be aware that the private practice of midwifery, and the public practice of the same in an hospital, are two very different things. In the latter the patient is under the rules of the institution, and, from her position in society, is accustomed to obey her superiors. But when he comes to deal with his equals and superiors in rank, he will at times encounter characters which require the greatest skill and steadiness of temper to control and direct them, and he will find it necessary to exercise this quality as much in reference to the friends as to the patient herself. In addition to the quality just spoken of, the obstetric practitioner requires a very considerable share of moral courage. To any one who has attended a long and difficult first labour, it is unnecessary to recall the anxious looks, the importunate questions, the expressions of surprise amounting to disappointment and even displeasure, at the delay. But to those about to undertake this duty, I would strongly urge the necessity of coming furnished with a large store of moral courage, by means of which they will be enabled to pursue steadily the course pointed out by reason and learning, unmoved by the importunities of friends, or the exhibition of impatience by which they may be assailed.....I cannot more appropriately conclude this address, than by quoting the words of one of the greatest ornaments of our profession:—"Whoever aspires at eminence and respectability," says Dr. Burns, "must, by unremitting study, purchase that honour which he is solicitous to obtain. I know that it is the opinion of many, that success in the medical world depends more upon interest than abilities. But I will venture to affirm that he who trusts to this maxim, and neglects the means of improvement, will find himself most miserably mistaken.

"No man will trust his own life, or the safety of those whom he holds dear, to any man, however powerful may be his recommendations, if he

once detects him to be a blockhead. In trifling ailments his ignorance may not be perceived, and years may glide on without any great impeachment of his character; but sooner or later difficult cases must occur, and his real character must be known. If a man of fortune, he may indeed still hold up his head, and assume the language of unconcern; but if his own subsistence or that of a family depend upon his employment, what will the consequence be? It is true that the generality of mankind are very incompetent judges of medical abilities; and therefore may, from accidental circumstances, raise a fool to some degree of honour; but notwithstanding his elevation, the fool still remains known only in the little sphere in which he moves, whilst the name of the learned spreads to distant lands. Even this success of the ignorant man must be only temporary. Some one better qualified than himself may come and pluck off his false laurels; some unfortunate case, sooner or later, must unmask his real character, and pitch him down to his proper station. But I shall say no more on the injury which by negligence a man may sustain in his character. I shall insist on a more important point; the life and safety of his patient. Need I remind him of those dangerous accidents which attend pregnancy and labour? Need I do more than mention those dreadful hemorrhages which are justly called floodings? Some of these may be stopped by easy means; but others require bolder operations. Can any man laying the most distant claim to humanity or honour, be easy when he is ignorant of these points? Can any one, not well acquainted with his profession, pretend to procure artificial delivery? Will he presume to say upon his own judgment, when it is safe, and when it is not? Should he stop to deliberate, if the reasoning of such a man can be called deliberation, may not the woman die before his eyes? Can he without uneasiness attend the more lingering illness produced by the fruitless efforts of the uterus to pass the child through an ill-formed pelvis? Will he dare to determine upon his own authority when the crotchet should be employed? Must the child be wantonly sacrificed, because he, in his ignorance, believes it to be requisite? Or must the mother perish, because he foolishly hopes that assistance is still unnecessary? It is a very poor excuse to say that he had no malice in his heart. The laws of this country may acquit him, but his own conscience must tell him that he is a murderer. It was unwarrantable and criminal to undertake the practice of a profession for which he was not qualified. It will be surely unnecessary to point out the reverse of this character, or to mention the happiness which the well-educated man derives from his knowledge. By the operation of a single moment he restores life to the dying. In the midst of every danger he is courageous, because he knows his own power and resources. His life is spent with honour to himself and advantage to others; his departure is beheld with sincere grief by those who had the happiness of being connected with him."

Address to the Dublin Obstetrical Society, by Dr. Beatty. Dublin Journal, March, p. 20.

Art. 100.—*On the Exhibition of Chalybeates in Chlorosis.* By M. Raciborski.

(*American Journal of Med. Sciences*, Jan. 1845, p. 118.)

As it is a matter of considerable importance in the treatment of chlorotic or anæmic conditions of the system to choose that preparation of iron which most readily enters into chemical union with the blood, M.

Raciborski engaged the assistance of M. Quevenne, Pharmacien-en-chef to the Hospital of La Charité, to investigate the properties of the ordinary preparations of that metal. These are included under the following classification :—

1st division. Non-saline Compounds
- Metallic iron.
- „ protoxide.
- „ peroxide.

2d division. Saline Compounds
- Protoxides
  - with a mineral acid.
  - with a vegetable acid.
- Peroxides
  - with a mineral acid.
  - with a vegetable acid.

Without enumerating the different preparations thus classed, it may be mentioned that those of the first division are rendered active only by meeting with an acid in the stomach; hence those are most valuable which are most readily attacked by weak acids; and among these none presents more advantages than metallic iron, prepared by passing a stream of hydrogen over an oxide of iron, inclosed in a tube, exposed to red heat; in which operation the hydrogen attracts the oxygen, and leaves the metallic iron in a state of extremely minute subdivision. M. Quevenne and Miguelard consider this preparation the very best.

Review of M. Pouchet, Raciborski, &c.

[In connexion with this subject, the following remarks by M. Selade may be thought interesting]:—

The best preparations of iron, considered in the light of a renovator of the blood, that is to say a medicine capable of restoring to the globules the iron which is deficient, are the "chlorure" (proto-chlorate), the carbonate, and the lactate. The acetate and citrate possess the same properties, but in a minor degree. The iodide of iron is superior to all these in rachitis and scrofula, especially in children, and in chlorosis complicated with the scrofulous diathesis. These diseases exhibit two morbid elements; the alteration of the fluids, and that of the solids, which is independent of the former. The medicinal treatment must be directed to both these elements at the same time, which object is perfectly accomplished by the union of the iron and the iodine.

The virtues of the sulphate are more particularly shown as an external astringent application, as also in certain alterations of the gastric mucous membrane; but its action is simply local, and therefore differs from the above-mentioned preparations, which are energetic only in proportion to their absorption.

The peroxide and the hydrocyanate of iron are more efficacious than other forms of the metal in certain pathological conditions. For example, the former is not to be surpassed as an antidote in arsenical poisoning. The hydrocyanate is particularly useful in idiopathic epilepsy, acting in a special manner upon the nervous fibre. It is therefore necessary in all cases in which we are about to exhibit a ferruginous preparation, to choose that which is most suited to the pathological condition which it is intended to rectify.

Mémoire sur les Preparations Martiales. Archives de la Méd. Belge, Fev. 1845.

Art. 101.—*On the Employment of the Juice of the Nettle (Urtica Urens) in Menorrhagia.* By M. Ginestet.

(*Encyclographie Médicale de M. Lartigue,* Oct. 1844.)

The common lesser nettle is a very old remedy in various kinds of fluxes, but, like many other valuable indigenous plants, has fallen into unmerited disuse. The following case is an instance of its virtue in menorrhagia:—A maid-servant, æt. 17, was attacked by a profuse sanguineous discharge per vaginam during the menstrual period. She was palsied and much reduced when seen by M. Ginestet. She was made to take 30 fluid drachms of the juice of the *Urtica Urens*, and in less than half an hour the hemorrhage, which had threatened her life, was completely suspended. Other cases are related by the author of the memoir, in which the success was equally decided. In order to prepare this juice, the plant, in any quantity, is bruised, with the addition of a small quantity of water, and strained through a linen bag. The dose is from 15 to 30 drachms. One dose is generally sufficient.

Art. 102.—*On Acute Ovaritis.* By M. Chereau.*

(*Journal des Connaisances Médicales,* November 1844.)

The ovaries, according to the author of the memoir which we shall endeavour to condense, are liable to inflammation under three different circumstances:—

1st. Under the influence of the puerperal condition, which is the most common cause.

2d. Shortly before, or immediately after, the appearance of the menses.

3d. Under the influence of inflammation arising in, and extending from, the neighbouring parts, as the womb, rectum, pelvic fascia, &c.

These three species of ovaritis he designates under the titles of: 1st, *Essential or primary ovaritis;* 2d, *Puerperal ovaritis;* 3d, *Symptomatic ovaritis.*

After the detail of cases illustrative of each of these forms, M. Chereau proceeds to the consideration of acute ovaritis under its different aspects:—

§ 1. *Anatomical lesions.* These occur in four degrees:—The *first* exhibits the organ slightly increased in volume, elastic, and shining; compression gives an indistinct sensation of fluctuation. Its tissue is more vascular than usual, especially in the neighbourhood of those Graafian vesicles which are on the point of maturation. The fallopian tube is sometimes also implicated, being vascular and situated more than usually near the ovarium. In the *second degree*, the size of the ovary is considerably augmented; a few days are sometimes sufficient to show it increased to three or four times its natural dimensions. At this time it also becomes the seat of a "red softening," by which the *stroma* is converted into a red friable matter, resembling the parenchyma of the spleen. In the *third* and *fourth degrees*, the softening first alluded to is more pronounced, and the organization of the ovary is more or less completely destroyed, the organ being converted into a diffluent sanious pulp.

* Mémoire pour servir à la Pathologie de l'Ovaire. Paris, 1844.

§ II. *Etiology.* The causes of this disease may be surmised by the division which the author has seen fit to make. Thus labour, the puerperal state, the menstrual orgasm, affections of the womb, are all capable, under certain circumstances, of giving rise to the complaint. The author has never seen it originate from external injury to the abdomen, believing that this more frequently gives rise to chronic affections, as cysts and tumours, than to acute inflammation. Ovaritis sometimes succeeds to vaginal blenorrhagia, as has been observed by Ricord and Vidal de Cassis.

The left ovarium is more frequently the seat of inflammation than the right. In forty-five cases in which the existence of the disease was clearly ascertained, it was situated twenty-five times in the left ovary, and eleven in the right. In four cases in both simultaneously.

The author explains this proclivity of the left ovary to disease, to its proximity to the rectum. The same opinion, which is also entertained by M. Tanchou, assumes the probability of truth from the fact that constipation is a frequent precursor of the inflammation, and we can readily conceive that the organ will be compressed and irritated by the impaction or passage of indurated fæces.

Other causes of ovaritis are the rheumatic diathesis, strangulation of the organ in an hernial sac, uterine injections, cold during menstruation, and perhaps the pressure of the fœtus.

§ III. *Terminations.* Acute ovaritis may terminate in resolution, suppuration, "ramollissement," gangrene, and induration. The first is the more frequent, and should be the aim of all our treatment.

Suppuration is also a very common event, but not so much as is generally supposed. It is an error to imagine that because the ovary or fallopian tube contains purulent matter, that there has been ovaritis as a matter of course; for it frequently happens that hydatid cysts become inflamed, and in that condition often secrete pus. The manner in which ovarian abscess becomes evacuated is various; it either remains free, in which case the pus is poured out into the abdominal cavity, or the abscess contracts adhesions with the neighbouring parts, in which case it may find an exit by the rectum, bladder, fallopian tube, abdominal parietes, or even through the walls of the uterus itself. Of the first event two cases are reported by M. Montault. Andral has met with a case in which the abscess had burst into the bladder,* as has also M. Murat.† Rupture into the vagina has been met with by Cruveilhier, Dance, and Husson. *Ramollissement.* This termination is mentioned by Ferguson,‡ Montault,§ and Cruveilhier‖ who, however, doubts its dependence upon inflammation. *Gangrene* of the ovaries is alluded to in an especial essay by Sichen. Cases are also recorded by Murat, Seymour, and Velpeau.¶

§ IV. *Symptoms of Acute Ovaritis.* There are three principal symptoms, the presence of which indicate acute inflammation of the ovarium. These are pain, increase of size, and the formation of a tumour. Occasionally the enlarged ovary may be perceived through the abdominal walls,

* Précis d'Anatomie Pathologique, t. II, p. 704.
† Dict. des Sciences Méd. t. 39, p. 17.
‡ Essays on Important Diseases of Females.
§ Journal Heb. de Méd. t. 1, p. 419.
‖ Casus sphaceli ovariorum. Upsal, 1768.
¶ Répert. des Sciences Méd. t. xxii, p. 574.

but it oftentimes descends still deeper into the pelvic cavity, where it can only be ascertained by examination per vaginam or per anum. Having ascertained the existence of a tumour, we have next to determine its nature, and this can only be done where the rational signs of ovaritis are absent, by "exclusion."

The maladies which are liable to be confounded with enlarged ovarium, are principally the following: phlegmonous abscess in the abdominal walls, abscess of the iliac fossa and psoitis terminating in suppuration, and distension of the bowel by fecal matter. This latter is readily distinguished from ovaritis by emptying the intestinal canal, either by an injection or by purgative medicine. If, after this, scybala are not evacuated, or, being passed, the tumour still remains, it is clear that the case is not one of fecal accumulation.

Abscesses in the abdominal walls may be known by their being evidently situated without the abdominal cavity, and by the fact that the parietes do not slide freely *over* the tumour, but that the whole mass moves together. The diagnosis will of course be rendered more obscure when there is adhesion between the tumour and the neighbouring parts, but even in these cases, the disease may be satisfactorily determined by examination per vaginam or per rectum.

Ovaritis may be distinguished from psoas abscess by the comparative freedom with which the patient moves the thighs upon the abdomen.

There are also certain rational signs which will assist us in the recognition of acute ovaritis. These are, a pain below the pubis, between the womb and the iliac regions; the pain extends to the loins and down the thigh, and is either acute and lancinating, or dull and pulsative. The external genital organs are unnaturally hot, the vagina in particular; the os uteri is often painful upon the slightest pressure. There is often a continual desire to void the urine, the act of micturition being likewise painful. The same irritation also extends to the rectum.

§ v. *Prognosis in acute ovaritis.* When taken in time, inflammation of the ovarium generally ends in resolution; if neglected or mistaken, suppuration is likely to ensue, and, in some cases, even gangrene. Puerperal ovaritis is a far more dangerous disease than the idiopathic forms, especially when it is combined with metro-peritonitis, and is induced by atmospheric influences.

§ vi. *Treatment.* This in the onset must be antiphlogistic. As acute ovaritis is generally seen in plethoric females, bleeding by the arm is almost always advisable. This may be followed by the application of leeches either to the groin or to the labia; with fomentations, saline draughts, stimulating sediluvia, soothing injections, hip-baths, &c. Calomel may be given with great effect, but should be suspended as soon as the gums are tender.

If, in spite of these means, the inflammation does not subside, and suppuration appears inevitable, we cannot do better than abide by the judicious advice of Dr. Churchill:*

"The aim of the physician in this case, should be to encourage the suppuration by means of cataplasms, constantly applied to the part.

"The formation of pus is sometimes indicated by a rigor, but more

* *Dublin Journal of Medical Science,* Sept. 1843.

generally it cannot be discovered but by manual examination. The abscess should be opened as soon as discovered, in order to prevent its bursting spontaneously into more dangerous regions. If, however, it appears situated so high as to risk the effusion of pus into the peritoneal cavity, it is advisable to adopt a proceeding recommended by Dr. Graves in abscess of the liver, namely, to divide the parietes of the abdomen only in part, and then to apply fomentations till the matter bursts spontaneously through the artificial wound. When the matter is evacuated, the patient's strength should be supported by a nourishing diet."

Art. 103.—*Simple Ulceration of the Os Uteri.*

(*London and Edinburgh Monthly Journal*, June 1845.)

The occurrence of simple ulcerations of the os uteri was denied by Boyer, owing, no doubt, to the little use made of the speculum in his day. Nothing, however, is more common than the appearance of these ulcers; and it may be said, that every woman labouring under leucorrhœa, purulent or lactescent, is affected by this disease, if not with cancer [!]. Five or six varieties of this affection are at present under treatment in the wards of St. Louis, under M. Jobert, and these have all been carefully studied by means of the speculum. It is so rare in ordinary practice to have so many patients under the eye at one time, and so inconvenient, moreover, to examine them in a suitable manner, that the present opportunity of doing so is interesting. The disease, as far as regards the ulceration, presents itself under various forms; but they all proceed from the same cause—hypertrophy of the neck. This hypertrophy, without doubt, precedes the erosion, and is sometimes accompanied with induration, sometimes with softening. The hypertrophic softening is sometimes considerable; in this condition, it presents no morbid sensibility; the ulceration appears, no doubt, as a consequence to this state, and in the natural process of chronic inflammation. The ulcers may have their seat on one or other lip, sometimes on both; in some instances they cover the entire circumference of the os tincæ, and in others they are seated deep in the neck of the uterus, where they are concealed by the swelling of the anterior lip; but even here they may be discovered by a proceeding which we shall presently indicate: so much for the seat of the ulcers. As to their form, they are sometimes superficial: simple aphthæ, of the size of a lentil, having their seat on the edge of the neck, and more or less numerous, which is the most simple case; these aphthæ, however, not unfrequently extend, become confounded together, and constitute a superficial erosion of a mapped form, and more or less irregular; the lesion then becomes more serious. It is not necessary, however, that an ulcer should pass through the aphthous stage to arrive at this state, for it may originate at once in the inflammatory process alone. This species of ulceration presents a great resemblance to those large erosions of the superior part of the cornea, described by Velpeau under the term "Ulcères à coup d'ongle"; it is, however, proportionably much larger. It may be compared more exactly to the surface of a suppurating blister; it is covered with granulations, bleeds easily, and is often infiltrated with blood; its aspect is therefore always red, but it is not painful to the touch. It is probable, that those women in whom there is hemorrhage after sexual intercourse, have some slight lesion of this kind.

In a third variety the erosion is no longer superficial, it is hollow, and sometimes very deep. Its base is more or less foul, its surface always of a

bright red, and infiltrated with blood. The erosion then very much resembles the ulcers on the legs of varicose subjects, after they have taken exercise. This kind of ulcer often causes a notch on one side of the os uteri, generally on the superior lip. In some cases the ulcer attacks the whole circle of the internal surface of the os uteri, and hollows out a cavity from above downwards. These hollow erosions must always be regarded with suspicion, more especially if they make any progress in depth, for their nature is frequently not simple; and if they have originally been so, they are liable to assume a bad character. As a general rule, an ulcer may be said to be simple when its surface is granular. In regard to form, the third variety resembles the preceding, it differs, however, in situation, being always in the neck. In conclusion, we have to repeat that there are three forms of ulcers of the os and cervix uteri; the aphthous, ulcerative abrasions, and the deep excavated ulcer; all, however, are more or less granular. Hollow ulcers which are not granular are suspicious.

Those affected with ulceration of the neck of the uterus are in general young, having seldom passed their thirtieth year; they have usually had a family or miscarriages, and have been for some time subject to abundant leucorrhœa and hemorrhages, or at least to fluxes of blood from the uterus other than the catamenial; their constitution is lymphatic; they are frequently dark women, of ardent feelings, with the pilous system highly developed.

The symptoms are of two kinds. On the one hand, an abundant leucorrhœa, with lactescent discharge; on the other, symptomatic phenomena peculiar to most other chronic uterine affections; viz. lassitude of the extremities, pain and dragging of the loins, want of appetite, and sometimes a painful contraction of the sphincter ani.

A precise diagnosis can only be obtained by means of the speculum; the "*toucher*" alone is insufficient; by its means a state of hypertrophy can merely be ascertained, and that not with much certainty. In order to institute a thorough examination with the speculum, the patient must be placed, not on the edge of the bed, as is generally done, but on a table, with the hips very much raised, and the thighs bent backwards, so that the knees almost touch the abdomen. It is then only by a strong ray of natural light that the fundus of the vagina can be distinctly seen. In order to examine the whole periphery of the neck, a double-valved speculum ought to be used, the cylindrical instrument does not embrace a sufficient portion of the hypertrophied cervix. At first there is observed on the uterus and fundus of the vagina a quantity of purulent mucus; on removing this, the disease becomes visible, the first thing that strikes the eye is hypertrophy of one or other lip, or of the whole os, and then the ulceration with which it is complicated.

As to treatment, nothing is more simple or certain. The disease is invariably cured in the course of a few months, by the means employed at St. Louis. Two lesions have to be considered, the one depending upon the other, viz. ulceration and hypertrophy. If these be merely aphthous ulcerations, slight cauterization with the acid nitrate of mercury, or even with the nitrate of silver, speedily produces cicatrization; the remaining hypertrophy, if it is not considerable, may be cured by the ordinary means. If the hypertrophy exist to a great degree, the actual cautery is used from the commencement. The same remedy is used for the third species of ulcer, so as to produce an eschar more or less deep. The cure is generally accomplished in from two to four months, but a sensible amelioration in regard to the pain and leucorrhœa is perceptible during the first week. It seems pro-

bable that concentrated heat causes such a modification of the diseased tissues, as to dispose them to the healing process. We earnestly entreat attention to the above facts; the disease is both frequent and disastrous among all classes, and especially in large towns.

Annales de Thérapeutique, Avril 1845.

Art. 104.—*Extirpation of the Uterus.* By M. Mollet.

(*Annales de Thérapeutique,* Jan. 1845.)

The subject of this operation was a woman of feeble constitution, æt. 47, mother of three children, who had experienced obscure pains in the uterus for the first time in 1831. The case was supposed at this time to be one of incipient polypus. At the end of 1843 bloody discharges occurred at short intervals, and in the course of the next year became more frequent and abundant. Her general health becoming much impaired she placed herself under the care of M. Mollet.

On the 25th of October the patient suddenly perceived something pass per vaginam, which upon examination proved to be the uterus, completely inverted (?).

It now became a question, what proceeding was to be adopted? Reduction was impossible; therefore the only chance for the patient was either to leave the disease to nature, or to remove it by operation. In the former case, everything was to be feared from the prolonged contact of the air, urine, &c. In the other, a considerable risk had, no doubt, to be encountered; but facts were not wanting to attest the possibility of success. As the patient became daily more and more exhausted, and ulceration with fetid discharge had commenced, the operation was at length decided upon, and performed in the following manner.

At the time of the operation, 11 a.m. the patient was in the following state:—pulse small and feeble; skin soft, without coldness. The tumour was of a grayish white colour, seven inches in length, three and a half in breadth. On the hypothesis that the case was one of total inversion of the uterus, it was agreed that as several important parts, such as the fallopian tubes, ovaries, fundus of the bladder, &c., might be dragged within the concavity of the organ, that an exploratory incision should be made, in order to ascertain what parts had become involved in the misplacement. This was done, after certain precautions had been taken to prevent serious hemorrhage. The bistoury plunged into a somewhat lardaceous tissue; but as no cavity was displayed, it became evident either that the tumour was not the uterus at all, or that that organ had been totally converted into scirrhus. Under these circumstances, it was considered safe to amputate at once by a circular incision. In this manner, the whole of the diseased parts were removed without hemorrhage, the operation lasting only thirteen minutes.

On examination of the parts, it was discovered that the diagnosis had been erroneous; that the uterus was not inverted, as was supposed, but merely dragged downwards by an enormous polypus, which had developed itself on the os tincæ. The patient died on the fifth day. [Appended to this case are some valuable practical remarks on the diagnosis of uterine polypi, which, as they in some cases are sufficiently doubtful to mislead even the most experienced practitioners, we shall extract for the benefit of our readers.]

"In polypi arising from the interior of the uterus, and projecting into

the vaginal cavity, the stalk of the tumour is always found more or less encircled by the lips of the dilated os and cervix of the organ; the tracing, therefore, with the finger this circle of the cervix round the pedicle of the polypus, forms the most important diagnostic mark in such forms of the disease.

"When however the polypus arises from the edge of the os uteri, or from the vaginal surface of the cervix, the above important diagnostic mark is wanting, and the case in consequence becomes one, the nature of which is often very difficult to determine. This difficulty of diagnosis does not merely depend upon our not finding the pedicle of the tumour encircled, as is usual in other forms of uterine polypi, but also from the still more fallacious circumstance, that the os uteri, though traceable in the stalk of the tumour, is generally so displaced in situation, and altered in form, as to render its identity doubtful. The difficulties attending the diagnosis of those forms of polypus to which these remarks refer, would in most cases be perfectly removed, if we could assure ourselves that the body of the uterus itself was of the natural size, and in its natural position, and that the imperfect cleft that may be traceable on the inside of the tumour was in reality the os uteri. If these points could be fixed with certainty, the attachment and nature of the tumour would at once become evident, the question of the propriety of its removal would be resolved, and the exact point of its removal more safely and certainly determined than otherwise could be. These important points in diagnosis we would in future propose to fix, by introducing the uterine sound into the cavity of the organ, so as to determine the real situation of the os, and the position and state of the uterus itself, as ascertained by the direction and length of its cavity. The introduction of the instrument in particular cases will require unusual care and patience, in order to pass it through the displaced and altered uterine orifice. But the clear information afforded by the examination in a set of cases which are often so perplexing in their character will amply repay the mastering of any such difficulties as I have presupposed in the employment of the means."

London and Edinburgh Monthly Jour. April 1845.

ART. 105.—*The Inverted Uterus successfully removed by Ligature.* By Dr. M'CLINTOCK, Assistant Physician to the Dublin Lying-in Hospital.

(*Dublin Journal;* March 1845, p. 48.)

The subject of this case was admitted into the hospital on the 30th of August, 1844, æt. 24. As far as could be ascertained she had been the subject of difficult labour with preternatural presentation, and the attendant had made use of force in extracting the child and placenta. The following morning a tumour made its appearance at the os externum, which was soon replaced; the tumour, however, prolapsed several times subsequently. She then became subject to profuse hemorrhagic losses by which she was much reduced.

Upon examination per vaginam a globular tumour was readily felt, round which the finger could be freely carried, and encircling the upper portion, the os uteri was plainly perceptible. On the 18th September Dr. Johnson applied a ligature of strong fishing-line around the neck of the tumour by means of Gooch's canula; after it was tightened she complained of some pain in the back. On the evening of the next day it was necessary to relax the ligature, in consequence of continued nausea and pain in the belly.

To relieve the more urgent symptoms of pain and loss of rest, it became necessary to administer opiates. Within the first two or three days the catheter was also required.

On the 18th day after the application of the ligature it was found that the neck of the tumour was more than half divided, and on the 28th day Dr. Johnson completed the separation by incision. From this time the patient went on satisfactorily in every respect, and was seen in perfect health six weeks afterwards.

ART. 106.—*Case of successful Extirpation of a Fibrous Tumour of the Peritoneal Surface of the Uterus by the large Peritoneal Section.*

By WASHINGTON L. ATLEE, M.D., Professor of Chemistry, Philadelphia.

(*American Journal of the Med. Sciences*, April 1845.)

June 8th, 1844.—Dr. Atlee was consulted by Miss L. P. and received from her the following history of her case:—

In the spring of 1843, she began to have frequent desires to urinate, but her attention was not particularly drawn to the circumstance until the 15th of October 1843, when she felt, for the first time, a tumour in the right groin, about the size of a pullet's egg. About two weeks previous to this, she had been thrown from a horse, from which accident she suffered very much in her right groin, side, and hip, and was confined to the house for several days. At this time she is not able to ride more than a mile without stopping to pass water, and she rises once or twice, sometimes oftener, during the night for the same purpose. She is in the habit of drinking very little in the evening, in order to prevent much disturbance from this cause at night. There has been no difficulty in the process of defecation, but she has been somewhat troubled with constipation, which she relieves with a simple soda powder or a pinch of salts. Her menstruation has always been regular but painful. It, however, has latterly diminished in quantity, is sometimes clotted, and is followed for a short time by fluor albus. Twice last winter she was seized with pain in the tumour, and down the thighs, lasting about half an hour and so excruciating as to almost produce fainting. She felt confident that the tumour was coming away at that time, as she believed it to be in the womb.

She is 24 years of age, rather over the medium height, has always enjoyed excellent health, excepting while undergoing medical treatment for the tumour. Her constitution is good, the digestive functions go on well, there is no other local disease, and her muscular and osseous systems are well developed.

I examined the patient and found a tumour occupying the hypogastric and right iliac regions, resting closely upon the pubic bones, being prominent above the symphysis, and gradually retreating toward the spine as the hand ascended towards the umbilicus; the fundus was hard, resisting, somewhat uneven, and presented an edge in the right iliac region. The only tender spot on handling was on its upper surface. It was moveable, and could be pushed upon the brim of the pelvis over to the left iliac region.

In examining per vaginam, the finger, as soon as it entered, came against the convex surface of a hard tumour, immediately below and behind the arch of the pubis, and resting firmly against it. This rounded surface extended throughout the pelvis, pressing the uterus down against the perineum and rectum so firmly that it required some slight force to insinuate the finger

between them. Upon the interior face of this tumour was a ridge about the thickness of a finger, occupying a central position, and running in the antero-posterior direction, which evidently was the cervix uteri, the os tincæ being plainly perceptible in its anterior end—the neck of the uterus appearing to lay between the tumour and the perineum, horizontally upon the latter. On carrying the finger around towards the left side, it fell into a sulcus apparently between two tumours, but which I supposed was caused by the inferior one being the flattened fundus of the uterus occupying that position, and the upper one being an enlarged ovarium. The fundus of the uterus was more evident upon the left than on the right side, and its neck and body appeared to have been moved upon the tumour. The uterus, while the tumour was in situ, was pretty firmly fixed in its position, and did not appear to have been altered in its texture or size, nor was it painful on handling. I now attempted to raise the tumour out of the pelvis, but it required considerable and continued force before I could effect it. I however raised it sufficiently high to get partially beneath it at the pubic region, and to sustain it while I continued the vaginal examination. The uterus now took its natural position more nearly, became moveable, and the finger could be passed between it and the tumour, so as clearly to show that the tumour was distinct from the uterus. Motion of the one did not affect the other, and both could be moved independently of the other. This part of the examination was most carefully conducted so as to leave no doubt resting on the mind. There was very little sensibility of the pelvic viscera, and of the tumour, in that region. When pressure, however, was made on the anterior part of the tumour in the vagina, it produced a desire to pass water. The bladder occupied this position, and could be distinctly felt.

By the examination per rectum, the tumour could not be felt immediately upon introducing the finger, but after passing it up a short distance it came against a solid convex tumour, which appeared to rest firmly against the sacrum. Beneath this tumour, and lying against the anterior wall of the rectum, the fundus or the uterus could be felt, and when the tumour was elevated, the finger could be passed between the two, and in this position also both were moveable independently of each other.

In a standing position, which caused the pelvic viscera to descend more against the perineum, the bladder, which contained a little water, was pressed below the tumour, and could be felt like a small purse resting against the posterior face of the pubis, with the tumour above and behind it.

The patient having called upon me with the expectation that a surgical operation was the only chance for relief, we sent her home without expressing an opinion in reference to an operation, and desired her to return in about one month to have the examination repeated. In the meantime she was to omit medical treatment, and live as if in the enjoyment of good health. I informed her, however, that there was no doubt of the existence of ovarian disease, and that a subsequent examination would most probably clear up any doubts I might have of the propriety of attempting its removal. Until her next visit she was requested to keep a diary of the state of her health.

My patient returned to Lancaster on the 7th. She had suffered during the interval at times from pain in the tumour and back. She had menstruated on the 19th, the discharge being profuse and attended with much pain. Another examination was instituted more extensively than previously. After surveying the tumour per vaginam et anum, I introduced a

sound into the bladder, but instead of passing up anteriorly to the tumour, it kept beneath it, going back horizontally and parallel to the perineum, so that it could be swept from side to side over the inferior convex surface of the tumour, showing that the bladder was beneath it, and that it was impossible for this organ to be lifted by distension above the pubis, being resisted by the weight of the tumour. I also at the same time endeavoured to pass a sound into the os tincæ, but finding it would not readily enter, I desisted. It was very evident, however, in this examination, that the upper part of the tumour occupied the right groin, the posterior part rested on the promontory of the sacrum, and its anterior portion on the symphisis pubis, and its inferior portion dipped deeply into the pelvis, so as to press down the pelvic viscera against the perineum. The tumour had increased in size, was rather more moveable, and in our opinion free from adhesions. As far as we were able to judge, through the thick undistended walls of the abdomen, and the simultaneous examination *per vias naturales*, we were of opinion that the pedicle might be an inch or over in length.

From the period of the first examination she was much less troubled with her water, the elevation of the tumour out of the pelvis at that time appearing to have relieved her, by removing its pressure from the bladder. This relief was permanent.

After viewing the case in all its aspects, I considered it one suitable for operation. This opinion was announced to the patient, the dangers and chances of the operation fairly stated in the presence of her sister-in-law, and the matter left wholly to her own decision.

Her father called on me on the 19th of August, with the intelligence that his daughter, after deliberating well upon all I had told her, had concluded to have the operation performed. He stated that she had come to that determination herself, without any influence whatever; that her mind was well prepared for any event, and that since she had settled the question for herself she was quite cheerful, happy, and in better health.

She had menstruated on the 16th, and had passed a considerable quantity of coagulated blood.

August 26th. Miss P. arrived in town. We examined her again the same evening, and found much the same state of things as before, excepting that the tumour had been getting larger. Her health was good, pulse 90, and she seemed in good spirits.

August 28th. After suitable preparation, the thermometer in the bedroom being 73 F., I commenced the operation at 11 o'clock, in the presence of Doctors Humes, F. A. Muhlenberg, Rohrer, Whiteside, Parry, and Cox, and Messrs. Richards, Mellinger, Miller, Dare, Kerfoot, Hershey, and Franklin; my brother, Dr. John Atlee, being my principal assistant, and Mrs. P., her sister-in-law, her female friend. I made a bold and free incision, about eight inches long, from the umbilicus to the pubis, on a line with the linea alba, cutting through the skin, a thick layer of adipose tissue, and the sheath of the recti muscles, until I exposed the peritoneum, between which I could see the folds of the intestines. Now pinching up the peritoneum carefully between my thumb and finger, I nipped it open with the scalpel. Through this opening I passed a grooved director, and with a curved, probe-pointed bistoury, I slit open this membrane, above and below, to the extent of the outer wound. As soon as an opening was made into the peritoneum, most of the small intestines, several inches of the transverse colon, and a portion of the omentum gushed out, and gave us a great deal of trouble during all the subsequent stages of the operation.

The bowels were of a reddish brown cast, tolerably vascular, and considerably distended with wind. There also issued from the cavity of the abdomen about four ounces of thin transparent serum. My brother now took the charge of the bowels, but found it very difficult to keep them out of the way. Indeed, it was utterly impossible to keep them within the abdominal cavity, and all that could be done was to hold them to one side while the operation progressed. The tumour was found occupying the right side, and dipping deeply into the pelvis, and upon passing an index-finger of each hand on each side of the tumour, until I got them rather under it, I was enabled, by using considerable force, to elevate it from its bed, and slip it out of the opening, which was merely large enough to permit its escape. Although the tumour was now entirely dislocated, it was still firmly held down by its attachment, so as to block up the wound; and this, with the mass of intestines lying out, so obstructed the cavity, as to render it extremely difficult to survey the pelvis. I however insinuated my finger alongside of the tumour into the opening, and the first thing I encountered was an immense pedicle, running from the tumour to the right side of the uterus, and about one inch and a half in length. This for a moment startled me. In order to examine the state of things, and that we might decide upon the propriety of severing so thick an attachment, I seized the tumour, and made gradual but firm traction, so as to elevate it and the adhering uterus to view. This was accompanied with some manifestations of pain, great distress in the back, violent neuralgia of the thighs, and considerable gastric disturbance. The tumour now being sustained by an assistant, the pedicle was found to be a very dense, thick, solid, vascular mass, about two inches in diameter, in a perpendicular direction, and one and a half inches thick in the antero-posterior diameter, rather diminishing as it approximated the uterus. It was determined to cut it; and I accordingly transfixed the pedicle close to the uterus, with a needle doubly armed with a three-stranded silk ligature, well waxed. The needle now being cut out, two ligatures now remained, in order that each might embrace half of the pedicle. In tying the anterior ligature, however, the resisting elastic pedicle relaxed the first knot, and thus taught us that too much care could not be observed in this part of the operation. I therefore employed additional and continued force upon the strands, and one of of them snapped. I replaced it immediately with the other ligature; and having drawn the first knot very tightly, an assistant kept it from yielding, by pressing firmly upon it with the point of his finger, until I had it perfectly secured. Another needle, similarly armed, was passed through the pedicle, near the same place, so as to include a small segment of the circle of the first ligature. The half of this ligature was secured in the same way on the posterior portion of the pedicle, while the two ends of the other half were permitted to hang out of the wound, the pedicle being suspended in its loop, to serve us in raising up the severed pedicle in case of hemorrhage. In transfixing the pedicle, the greatest care was requisite to prevent the bowels being wounded by the point of the needle. I therefore adopted the precaution of passing my left index-finger down behind the pedicle, and receiving the needles' point upon it; I kept it thus shielded until it was drawn out beyond danger. In order to make things doubly secure, a four-stranded ligature was thrown around the whole pedicle, midway between its transfixed position and the tumour, and tied first with a single knot, which was kept from slipping by grasping it in the fingers, and then again made to encircle the pedicle, and carefully secured. The pedicle was now

severed close to the tumour. At this instant a gush of blood took place from the cut surface, but it being black our apprehensions were soon allayed,—it was the strangulated circulation of the tumour amounting to from two to four ounces, and was the only hemorrhage that occurred. The tumour being removed, the cut surface of the pedicle was examined, and although innumerable vessels with open mouths showed themselves like the pores of a sponge, we were rejoiced to see that not a single drop of blood escaped. The great mass of intestines which were out, and occupying the whole wound, prevented us from seeing into the cavity of the pelvis. Besides, the pelvis was unusually deep. I made, however, a careful survey of it with my finger, and considered the uterus and left ovary perfectly healthy in every respect. I also felt the fundus of the bladder, which appeared to contain a small quantity of fluid. After removing the coagulated blood, and clearing the surfaces with a small sponge, we endeavoured to replace the bowels, but could not succeed, the cavity being apparently too small to receive them. I at length transfixed the two lips of the wound at the centre with a sewing needle and secured them with a twisted suture. Then every inch from that point upwards I applied a similar suture, retaining the intestines and omentum carefully at each point of application, until the upper half was thus secured. My brother supported with the palms of his hands the intestines that remained out of the inferior part of the wound. Just at the time of completing the upper portion of the wound, violent efforts at vomiting supervened, the diaphragm and abdominal muscles acted powerfully, producing a great expulsive force in the abdomen, and caused the bowels to burst out between my brother's fingers while endeavouring to restrain them, and also forced the upper part of the wound into a prominent ridge, with a gaping between each of the needles, through which interspaces we expected every moment to see the bowels rush. A portion of the omentum did escape at the upper part of the wound. During this exciting time I supported the closed part of the wound with my hand, and called for twenty drops of elixir of opium, which soon calmed down the stomach, so that we could proceed in the dressing. In consequence of these efforts producing such a strain upon the wound, I gave it additional security by introducing a hair-lip suture between every two needles already employed. The lower part of the wound was secured at half-inch distances by the same kind of suture, and the intestines gradually pressed in as we progressed downward, until the whole wound was perfectly secured by fifteen twisted sutures, and so firmly that it would resist the most powerful expulsive efforts that could arise. Considerable care was required in passing the needles through the lips of the wound, to prevent their points becoming entangled in the folds of the intestines and wounding them. The ligatures came out at the lowest point of the incision, and were secured to the abdomen by a strip of adhesive plaster. Adhesive plaster was also laid under the ends of the needles to shield the skin. A fold of patent lint, a compress, and a towel bandage, completed the dressings, after which the patient was lifted from the table into bed, and ordered occasionally a couple of teaspoonsful of cold water.

The operation lasted nineteen minutes and a half from the time the knife was laid upon the abdomen until the tumour was taken away; a large portion of the time being consumed in deciding upon the propriety of cutting the pedicle. The wound was dressed, and the patient laid in bed before twelve o'clock. She bore the operation with remarkable fortitude, complaining only when the tumour was dragged up from the pelvis, and at other times giving an occasional moan.

[The operation was not followed by any untoward event of consequence; occasional vomiting, with a variable state of pulse, being the most marked symptoms. In about three weeks from the day of operation, the patient was so far well as to be allowed to return home.]

Description of the Tumour. The tumour weighed 1 pound 13 ounces; its several circumferences were 1 foot $7\frac{1}{4}$ inches, 1 foot $6\frac{1}{2}$ inches, and $11\frac{1}{2}$ inches. The cut surface from which the pedicle was detached, is $2\frac{1}{4}$ inches and $1\frac{5}{8}$ inches in diameter, and 6 inches in circumference. The tumour is very dense and solid. In cutting it, the knife feels as if going through sole leather; it partakes, in a very slight degree, of the crackling feel of scirrhus. I split the tumour through the centre—it has a beautifully variegated, flesh coloured, appearance; its cut surface is studded over with stellated points, the radii formed of alternate whitish and flesh-coloured lines, which also run in other directions, and intermingle with each other under various forms. Small orifices can be seen opening on to these cut surfaces, and must be vessels cut across in making the section. The tumour is invested with two distinctly marked tunics—the peritoneal and proper coat; both very closely united, and both dense. The proper coat is less closely united to the surface of the tumour, than to the peritoneal coat. At two or three places, these two coats are separated in patches about the size of a finger-nail, and looked like emptied blisters. The tumour is undulated over its whole surface, has a pinkish white colour, and in its external aspect has all the characters of some specimens of encephaloid degeneration that I have seen. Large vessels can be traced ramifying under its coats, and concentring towards the site of the pedicle, and terminating with open mouths upon its cut surface; one of these vessels is as large as a common goose quill. The tumour is of a uniform structure, no part having softened down. I think it may be denominated fibrous, or fibro-cartilaginous.

Remarks. The above case, in my opinion, is one that goes far in testing the propriety of gastrotomy. The cavity of the abdomen was laid open to the distance of 8 inches, and exposed nearly half an hour under very unfavorable circumstances. The great mass of the small intestines, a large portion of the colon, and a part of the omentum, were forcibly and suddenly ejected, and exposed to a temperature, during all this time, of at least 25° below their natural heat; they were subjected also to constant handling, in opposing their unceasing tendency to be forced out,—occasionally by the most powerful expulsive efforts,—and in continually folding or turning them out of the way; and to considerable pressure and unusual force in replacing them. To this, succeeded the repeated riding of the viscera for several days against the ligatures and wound, in the strainings to vomit. This was a state of things calculated to produce the most intense and fatal form of inflammation; for it must be evident, that peritonitis of the viscera is necessarily more mortal than that of any other form, and that that which supervenes in consequence of omental or parietal attachments, where there has been no exposure or handling of the bowels, is much more innocent and controllable. In Miss P.'s case, therefore, peritonitis of the most violent and obstinate grade, was to be apprehended This did occur, but it yielded to active antiphlogistic means as readily as idiopathic inflammation In the treatment of this case, however, we were convinced of the necessity of having our patient under our immediate charge, as death most probably would have occurred from inflammatory action, had it not been promptly and decidedly met.

Another cause, favoring the successful result in this case, was the

difficulty of access to the pedicle, and the continued traction necessary to bring it into view. This gave the most pain in the operation. It was not until the uterus was dislocated, and considerably raised, that the thick, short, and dense pedicle was brought in sight, and this was transfixed and tied closely to the uterus, a circumstance likely to excite metritis. This, however, did not occur, as the several vaginal examinations satisfactorily proved.

Yet notwithstanding all these unfavorable circumstances, my patient is a living record of the propriety of the operation, and her recovery a strong argument towards establishing it in the minds of the profession.

It might be said that my patient was not yet driven to the necessity of an operation, and that she might have lived a considerable time in comparative health and comfort. But I would ask, has not the great error in this long decried operation been to wait too long? Has it not been performed in cases where the vital functions have been so deranged that death would have been the inevitable result of *any* great change or sudden impression on the system? Look for instance at Dr. Chrysmar's last case, Mr. West's third case, Mr. Phillip's, Mr. Greenhow's, and Mr. B. Cooper's cases. Has it not been deferred until such extensive adhesions have been formed with important organs, and until the mere size of the tumour has so deranged and impeded the most essential functions, that expectation of recovery was almost out of the question? (See Chrysmar's third case, and Clay's sixth, tenth, and twelfth cases.) Has it not been deferred until the disease has progressed and implicated adjacent organs, whose extirpation is almost necessarily fatal, and where the surgeon ought to have closed the wound without completing the operation? (I allude to Clay's fifth and fourteenth cases, and to Mr. Heath's case.) And ought it not to be a matter of surprise that, amongthe cases upon record, so many have terminated successfully in spite of the most unfavorable circumstances? (Take for example Dr. Roger's case, Clay's third and thirteenth cases, and my brother's first case.) If an earlier period for gastronomy were selected, before the health had given way, when none of the important functions had been impaired, is it not likely that the proportion of the recoveries would be much greater than the present ratio? The mere wounding of the peritoneum and exposure of the peritoneal cavity cannot alone constitute the danger in this operation. This is seen in the thousand accidents to the cavity; in the timely operations for hernia; in paracentesis abdominis; in the no tumour peritoneal sections of Messrs. King, and Dulhoff, and in the unfinished cases of ovariotomy of Messrs. Galenzowski, McDowel, Smith, Lizars, Granville, Dieffenbach, and Walne, where the very circumstances which led to the operation were calculated to give a fatal preponderance to such exposure. If then this membrane can be torn, punctured, cut, and its cavity exposed in so many ways with comparative impunity, why wait until these tumours acquire the bulk of ten to seventy pounds or more, before attempting their extirpation? Why wait until the tone of almost every organ in the body is impaired by pressure or congestion, when the wheels of life are literally clogged, or when death would necessarily result from any other capital operation? Why wait until the pathological condition of that very membrane, which has been a spectre to so many, is past recovery? I therefore repeat the question, is it not surprising that success should attend in any case, as it has in several of such extent? But let this operation be performed under the same circumstances that are selected for other operations, when the system is in its best condition, and before health has been invaded

by the disease, and I feel confident that its legitimacy will be established in the minds of the profession.

Besides, it is admitted on every side that these diseases are beyond the reach of medicinal agents. "They seem to be removed so far from the general sympathies of the system; so insulated in position; so independent in function; that the common agents for the removal or control of disease seem to waste themselves in unavailing attempts to influence their actions, or to modify their affections. Who flatters himself that he has removed a dropsy, resolved a scirrhus, or interrupted a suppuration in these bodies? We believe, if he be candid, none will declare he has. Little more, then, is ascertained at present, than that these parts are very liable to disease, and but very little susceptible of cure. Unfortunately, they have much more frequently furnished subjects for the anatomist's knife than triumphs to the physician's skill." (Dewees.) "There is little prospect before a patient afflicted with this disease but long continued annoyance, more or less suffering, and, sooner or later, broken health, a shattered constitution, and death." (Churchill.) It is needless to multiply authorities; no fact is more generally admitted. If, then, medicine will not reach it in any of its stages, and surgery be not only the dernier but the only resource, why delay resorting to the latter until a period when an operation of magnitude, of any kind, would be condemned? The opinion of Hunter, too, so often quoted by our opponents, that the less done for it the better, strongly sustains our argument; and was clearly given only in reference to its medicinal treatment and tapping. This opinion is corroborated by the testimony of the whole profession, and by the case of Miss P., whose general health suffered most whilst under medical treatment.

With this view of the matter, I cannot regard the present list of operations, numerically considered, as a fair test for the propriety of surgical treatment, as in many cases the knife was resorted to when death was staring the patient in the face; and consequently, I cannot consider the ratio of mortality as fairly established. I would not wish, however, to be understood as urging extirpation at an early period, when the disease is stationary and inactive, and at the same time independent of serious symptoms; but delays are dangerous under opposite circumstances.

According to the diagnosis the case was considered ovarian tumour; and during the excitement of the operation, a doubt of the correctness of this opinion did not arise. A close examination of the tumour afterwards, and a calm review of all the circumstances, led me to question the existence of ovarian disease: the peculiar form of the pedicle—its vascular, fleshy, and resisting structure, entirely free from any fold of the hyoid ligament, free from any evidence of the Fallopian tube, and having an almost sessile union with the uterus; the uniform and fibrous structure of the tumour,—no fimbriæ or disintegrated ovary traceable within it, while the latter could not have become assimilated in structure, the disease not being malignant, the investment of the tumour being perfectly smooth and free from folds or shreds of membrane, and the tumour located upon the uterus as if stuck there—all inclined me to doubt its ovarian character, and to consider it a fibrous tumour of the uterus. This opinion has been fully corroborated by my brother's unfortunate case, as will be seen by referring to his report. I am aware, however, that Bayle says, that the development of fibrous tumours of the uterus has not been noticed before the 30th year, although Ingleby thinks he has detected the disease in girls under the age of 20. I am also aware that authors, in treating of fibrous tumours of the uterus,

generally speak of them as occurring within its cavity ; and that cases are reported of scirrhous, cartilaginous, and fibrous tumours of the ovary having been extirpated, and also of having been met with in examinations after death.

The extension of gastrotomy to fibrous tumours of the uterus may perhaps be condemned. This case might have been reported one of ovarian tumour, if I had not preferred to relate things as they are. I pledge myself to the profession to treat this subject in all truth and candour, to falsify, omit, or withhold nothing, and to write down errors, if such there be, in honesty and without fear—taking censure when deserved. In the decision of a matter of such weight to humanity, personal sacrifices ought to be utterly disregarded. If this operation is to be established, it must be on *correct* statements ; if it fail on such testimony, it fails justly and for ever. But if its establishment be attempted on falsified reports and withheld facts, then human life must fall a sacrifice to personal and professional dishonesty, and the effort must necessarily die, covered with a mantle of human gore. Let the question be therefore met as it ought to be, and its history be a record of truth. I have acknowledged that the case was considered an enlargement of the right ovary, and this is the reason why I examined only the uterus and left ovary before closing the wound, believing the right one to have been extirpated. Proving to be a case of fibrous tumour of the uterus, it did not lessen the dangers of extirpation, as the same parts were involved, and the risks to the uterus and of hemorrhage increased. This, therefore, was an error of diagnosis. Should such errors of diagnosis as occurred in this case, militate aught against the operation ? I think not. For whether it be the right or the left ovary, or whether it be an ovary or uterine tumour, provided the case can be clearly diagnosticated as fit for gastrotomy as this case was, it could not affect the result. And the result is the great object after all. For should we start out to extirpate the right ovary, and end by cutting of the left, or instead of amputating either, we excise a uterine tumour, it in no material way varies or magnifies the operation, nor affects the result. This case, therefore, may be of essential service, by proving that ovariotomy is not the only form of gastrotomy worthy of consideration, and calls in question the position assumed by British writers; that the impossibility of knowing exactly beforehand the *exact* condition of the organs which it is proposed to extirpate, forms one of the strongest arguments against the operation. Fibrous tumours, growing from the peritoneal surface of the uterus, sometimes reach to an enormous size, and, from their solid character, are likely to impede the functions of adjacent organs more than an ovarian cyst. Indeed, death has even been produced by injuries to the viscera, interposed between the enlargement and the parietes of the abdomen. The same circumstances, likewise, calling for extirpation of the ovaries, obtain here, and the removal of such tumours must be equally legitimate.

To the advocates of gastrotomy it is gratifying to observe, that this operation is gaining ground in the estimation of British surgeons, notwithstanding some of their reviewers have condemned it without measure.

The question of preference in regard to the kind of section, minor or major, is still under discussion, but according to the statistics, the ratio of mortality is least in the former. In addition to the arguments in favour of the large section, there is one light, however, in which this matter appears not to have been viewed, and which, necessarily having an important bearing upon this question, must be an element in the calculation, which will prevent its definite decision. In all minor sections, the tumour must

be cystiform and free from adhesions—a state of things most favorable for either operation. In solid tumours, or adhering cysts, the minor section must give way to the major operation—a state of things more unfavorable for success. Those very cases, where the weight and pressure of a solid tumour have been impeding the functions of the viscera; where adhesions indicate pre-existing disorganization of parts, and an injurious check upon their normal mobility; where the operation is necessarily accompanied by much more violence; where there are many more points of irritation by ligatures and where more extensive changes in the relative position and condition of the abdominal and pelvic organs follow—are those in which, apart from the mere size of the wound, the worst results would be anticipated, and in which too, the large section only would be employed. I see no way, therefore, in arriving at any accurate results, as the circumstances so greatly differ, nor can I conceive the use of attempting its decision, when the condition of things must govern in the case after all. I can see no particular reason why the minor operation should be preferred to the major; and until we become more familiar with all the shades of diagnosis, so as to clear up all doubt about adhesions and the character of the tumour, I shall consider the large section as safe to the patient and more satisfactory to the operator; and that the arguments in its favour, advanced by Messrs. Clay and Walne, remain unaffected by the results. I would also call the attention of the profession to the fact, that the last case of Mr. West, and the case of Mr. Hargraves, both of which recovered from the minor operation, were not cured of the disease, aud that where there are complications of disease, as in the third case of Mr. West, and in Mr. Phillip's case, the minor section is likely to prove as fatal as the major.

Having with considerable labour prepared for convenience of personal reference, a tabular synopsis of all the operations so far as they have come to my knowledge, and referred to the authority for each case, I offer it as the most accurate and extensive collection of cases yet published. [In this table all those operations are called major, in which the incision exceeded four inches, those below it being denominated minor. We shall not reprint the table itself, but content ourselves with giving the author's abstract of it.]

In this table 101 operations are noted, 18 of the minor section, 75 of the major, and 8 unknown. Of the minor operation 13 recovered, 5 died, or 1 in 3·5. Of the major 44 recovered, 31 died, or 1 in $2\frac{1}{3}$. Of the unknown 6 recovered and 2 died, or 1 in 4. Total 63 recovered, 38 died, or 1 in $2\frac{2}{3}\frac{5}{8}$.

Of the 101 operations, 20 or 1 in $5\frac{1}{20}$ were not completed; in 6 or 1 in 16 there was no tumour found.

Of the unfinished operation 12 were the large section, 6 the small, and 2 unknown: 7 of the first recovered, 5, or 1 in $2\frac{3}{5}$ died; 3 of the minor recovered, 3 died, or 1 in 2. The unknown recovered. Total, 12 recoveries, 8 deaths, or 1 in $2\frac{1}{2}$ of the unfinished cases.

Of the operations in which no tumour was found, 5 were the major, 1 minor. In 11 cases, other important diseases coexisted: death occurred in all but 1. Of these 8 were the major operation, 2 the minor, the other unknown.

In 42 cases there were adhesions; in 28 none; in 31 not stated. Of the first, 24 recovered; 18, or 1 in $2\frac{1}{3}$ died: of the second, 1 in $3\frac{1}{2}$ died.

[Abstracting certain cases in which the operation of gastrotomy ought not to have been performed, and others in which complications existed,]

we shall have 90 cases: 62 recoveries, 28 deaths; that is 1 to $3\frac{3}{141}$ [$2\frac{3}{14}$ Ed.], which is perhaps the fairest estimate of the mortality of the cases at present on record.

The average period of death in 26 cases in which it is noted, is 5·7 days after the operation.

Art. 107.—*On the Palliative Treatment of Carcinomatous Ulceration of the Os and Cervix Uteri.* Dr. Ashwell gives the following formulæ for the moderation and correction of the fetid and irritating discharge which adds so much to the misery of sufferers under this painful affliction. When the discharge is thin and ichorous, a daily injection consisting of sinapis pulv. ʒij, aqua ferventis ʒxvj, will be found highly serviceable. When it is necessary to employ sedatives, he recommends the following:—

℞ Liq. opii sedativ. ♏xxx.
Infus. valerian. ʒj.
Mucilag. acaciæ, ʒss. ft. Enema.

or ℞ Fol. belladon. exsiccat. grs. xij.
Aquæ ferventis, ʒvj. M. f. Enema.

Dr. Ashwell's favorite astringents are—

℞ Decoct. secalis cornut. ʒxiv.
Argent. nitratis, grs. xx.
Tinct. catechu, ʒiij. M. f. injectio per vaginam.

Of this four ounces are to be thrown up twice a day. The decoction of secale is made by an ounce to a pint and a half of water boiled down to a pint.

Another is Infus. quercus, ʒiv.
Pulv. gallarum, grs. xxx.
Tinct. catechu, ʒij. M. f. injectio.

or Argent. nitratis, grs. xv.
Aquæ rosar. ʒxvj. M. f. injectio.
Injicientur, ʒiv, ter in die.

On the Diseases Peculiar to Women, 8vo. 1844.

Art. 108.—*On Retroversion of the Uterus.* By M. Lacroix, M.D.

(*Annales de la Chirurgie*, Avril 1845.)

The author of this essay, gives in the first place, a minute history of the displacements of the uterus, from the writings of previous authors, after which he enters immediately upon the subject of his communication.

Retroversion is a term applied to that form of displacement of the womb in which its fundus is directed backwards into the hollow of the sacrum, the neck being at the same time tilted forwards against the pubes. The organ is particularly disposed to this derangement from its anatomical peculiarities, which are such that its greatest diameter is vertical, and its greatest weight distributed above the centre of gravity.

Causes. These anatomical circumstances are sufficient in some cases to produce retroversion without the intervention of any secondary cause. But in others there may be at the same time too great width, or too narrow a condition of the pelvis, each of which is capable of causing the accident. In the first case it is allowed by the length and relaxation of the ligaments; in the second, the fundus is held down (Callisen and Boivin) by the promontory of the sacrum, and, therefore, as the organ becomes developed by pregnancy, its displacement is inevitable. Retroversion may also be caused

by fullness of the bladder, (Denman, Merriman, Callisen, Böer, &c.), by accumulation in the rectum, and by the pressure of the superposed intestines.

Continual abdominal pressure by corsets may determine retroversion in the early months of pregnancy in two ways: 1st, by the action of the intestines, which, as they are prevented from rising, depress the womb: 2d, by the pressure of the abdominal parietes, which push it backwards towards the sacrum. Other causes may be found in the too great width of the vagina, produced by repeated confinements; in the weight of the uterus itself, depending upon inflammatory engorgement; and lastly, in pregnancy. In the latter case the retroversion ordinarily takes place about the fourth month, though cases are on record in which it happened at the fifth (Smellie), and even in the seventh (Merriman, Bartlett.)*

Influence of Age. There is no period of life which is not exposed to the accident of retroversion, whether in the impregnated or unimpregnated state of the organ. In the virgin state, the uterus has been found retroverted at the period of infancy (Jacquemier), as well as in middle and advanced age.

Symptoms and Progress. Retroversion may take place suddenly or gradually. In the latter case, the cause is generally to be found in an engorged state of the uterus itself, or in an increase in volume of the surrounding parts. The symptoms are shown in various derangements of the neighbouring organs. There is usually difficulty or complete inability to pass the urine. In other cases where the displacement is gradual, the neck of the bladder is irritated as by a calculus, and the patient is tormented by continual inclination to empty the bladder. This symptom is readily explained, as is likewise the retention of urine, upon the principle of mechanical pressure.

Next in succession to the symptoms attendant upon pressure upon, and irritation of the neck of the bladder, are those which the retroverted uterus causes by its pressure upon the rectum. When the displacement takes place suddenly, the first announcement of the accident is sometimes a violent inclination to, without the power of emptying the bowel. This feeling of tenesmus becomes more and more urgent as the case progresses, and the fecal matter when it does pass, is flattened and moulded into the shape of a riband. At length, the obstruction may become complete, and then arises all the train of symptoms characteristic of intestinal obstruction.

Whether it be by sympathy or direct irritation, is not so evident, but it is often seen, nevertheless, that when the retroversion is sudden, either in the virgin or pregnant female, hiccup, flatulence, vomiting, fainting, &c. commonly show themselves; and even when the displacement is more gradually produced, analogous symptoms of less intensity are present. The direction of the vagina is likewise altered, so that the superior wall becomes elongated and stretched upwards behind the pubes. The posterior wall is thrown into transverse rugæ, in the first place, because it is too long for its new situation, and secondly, because the fundus of the retroverted womb presses it downwards.

If a vaginal examination be made, the fundus of the uterus will be distinctly felt, and has been mistaken for the enlarged cervix, or even a vaginal tumour; the os uteri will at the same time be perceived under the symphisis pubis.

Diagnosis. The diagnosis of retroverted uterus is for the most part simple, but frequent mistakes may nevertheless be made. The accident

* A case will be found in the *Gazette Médicale*, Mai 3, 1845, in which the displacement was only discovered during labour. [Ed.]

may be either overlooked where it is present, or suspected where it is not; many of the rational signs of the affection being so modified as readily to give rise to hesitation. For instance, one of the most common symptoms, stoppage of the urine, may not be present, because the retroversion is not direct, and the os uteri, therefore, does not compress the urethra (Martin). On the other hand, the obstruction to the flow of urine, without a vaginal examination, may call the attention exclusively to the bladder, and the case be then considered as one of stone. Constipation is also another prominent symptom; this may likewise be a source of error, and be attributed to intestinal obstruction, depending upon other causes. If there be hemorrhage, the case is apt to be considered as one of threatened abortion; or, if the woman be not pregnant, the attention may be exclusively arrested by the loss of blood. Lastly, the symptoms of peritonitis, which may supervene as the ultimate consequences of the retroversion, may be mistaken for those of the idiopathic disease.

There is, doubtless, no single sign of the accident which can be depended upon; taken per se, their value arises solely from their concurrence. If we, therefore, have difficulty in passing the urine and fæces, especially arising suddenly, and to this be added the discrimination of a tumour, placed between the rectum and vagina, and projecting into both, together with the presence of the os uteri under the pubes, there can be little difficulty in diagnosing retroversion of the uterus.

Treatment. When the malady has been once satisfactorily ascertained, it is of great importance to reduce the displaced uterus as speedily as possible. In order to accomplish this, two indications must be fulfilled. The first is to attend to the organs which are interfered with by the displaced uterus; the second, to restore the latter to its normal position.

The bladder, then, must be emptied in the first place, as it is this organ which is generally suffering earliest from distension. This may sometimes be done by causing the woman to place herself upon her knees, in which posture, the urethra may be liberated from the pressure of the os uteri; but if this manœuvre does not succeed, we must have recourse to catheterism. This operation is, however, generally one of great difficulty, and often impossible. In the latter case, what is to be done? M. Lecroix says, puncturate the bladder, for severe as this may be, it is less hazardous than running the risk of its rupture.

The evacuation of the rectum is as necessary, and as difficult in some cases, as that of the bladder; sometimes, injections and purgatives will alone effect the replacement of the womb, but if the fecal matters are too solid to be thus removed, they must be extracted by a spoon, as recommended by Moreau.

Division of the symphisis pubis has been advised in otherwise insurmountable cases, by Purcelle and Gendrin. But the better proposition, when the woman is pregnant, is to empty the womb by puncturing the membranes.

In order to reduce the uterus to its natural situation, two proceedings are employed: the one, by an attempt per vaginam; the other, per rectum. When the former measure is decided upon, two or three fingers are to be introduced, and the uterus is to be pushed upwards. The reduction by the rectum, however, offers the greatest facilities. When the finger is either not sufficiently long or powerful, the introduction of an instrument to act as a lever, has been advised. In certain cases, all operative means fail; in others, the reduction is effected by the natural course of pregnancy. (P. 420-480.)

Art. 109.—*Remarkable Case of Extra-Uterine Fœtation with Stone in the Bladder.* By Dr. R. Leitch.

(*Edin. Monthly Journal*, Feb. 1845, p. 106.)

The subject of this curious case was an emaciated female, æt. 46, who applied for relief of the symptoms caused by calculus in the bladder. Before her system could be sufficiently strengthened to allow of the operation, she sunk. The post-mortem examination showed a thickened and ulcerated bladder, containing a stone of unusual shape. In the right iliac fossa was a round substance, which proved on examination to be the remains of an extra-uterine fœtation. The singular shape of the stone having excited surprise, it was examined more carefully, and was found to consist of triple phosphate, the nucleus being a fœtal tibia which had gained access to the bladder by ulceration of its coats.

Art. 110.—*On the Sex of the Child as a Cause of difficulty and danger in Parturition.* By Professor Simpson.

(*Edin. Monthly Journal*, Jan. 1845, p. 78.)

Professor Simpson demonstrates that the dangers of parturition are greater to the mother in the case of male than female births, and does so by proving, 1st. That of mothers who die in childbed and its diseases, a much greater proportion have given birth to male than female children; and 2dly, That in laborious and complex labours the sex of the child is much oftener male than female. Thus of 154 deaths, in 105 the child was male, in 45 female, that is in the proportion of 214 to 100.

He likewise gives the following table, illustrative of the proportion of male and female children in cases of tedious and complex labours.

Nature of Complication.	Total Cases.	Male Births.	Female Births.	Number of Males to Females.
Tedious labour .	119	65	54	148 .. 101
Convulsion . .	28	17	11	153 .. 100
Puerperal fever .	88	54	34	161 —
Ruptured uterus .	34	23	11	207 —
Hemorrhage . .	44	31	13	240 —
Forceps case . .	24	16	8	200 —
Crotchet do. . .	74	50	24	200 —
Total .	411	256	155	200 — 100

The author next proceeds to show that the dangers and accidents in parturition are greater also to the *child* in male than in female births. This is illustrated by the following facts:—

1. That a larger proportion of still-born children whose mothers die from labour or its consequences, are male than female; and, on the contrary, of those which are born alive, the greater number are females.

2. The proportion of still-born male children is greater than of female in the proportion of 130 to 100.

3. Of children which die in the actual progress of parturition, the number of males is greater than that of females.

4. More males than females suffer from the morbid states and injuries consequent on parturition.

5. More male than female children die in the earliest periods of infancy.

Dr. Simpson then proceeds to inquire into the causes of the greater danger both to mother and child in male births, and first establishing, in opposition to Quetelet, Clarke, &c., that male fœtuses are not in their intra-uterine life more liable to disease than female, by showing the proportion to be equal in still-born *putrid* children and in premature births; he produces measurements to show that the transverse diameter of the head is 1-8th greater in male children.

To this slight increase, Dr. Simpson refers the greater number of casualties and complications accompanying male births. The whole process of labour is rendered more tedious in consequence of the size of the head in these cases being so closely proportioned to the size of the maternal passages.

The following table shows that the actual duration of labour is greater in male than female births:—

Labours.	Duration of Labour.	Average do.
With Males 249	2046 hrs. 33 min.	10 hrs. 38 min.
Females 178	1702 „ 29 „	9 „ 34 „

"It will probably," the author observes, "be allowed that the principal, or indeed sole obstacle, which the mind has to contend with, in allowing the very small increase in size of the male infant head over the female to be the cause of the remarkable difference which we have traced between the results of the male and female births, consists in the difficulty of at first supposing so slight an apparent cause to be the agent by which such remarkable consequences are brought about. But in considering this and analogous questions, it must be held in recollection, that in all processes, whether vital or physical, in which, as in parturition, an established relation of mechanical conditions is required, any disturbance in these conditions, however trifling in itself, will, when followed out through an extended series of observations, be found to lead to results, the magnitude of which could scarcely have been previously surmised. From any study, however minute and accurate, of a limited number of cases of labour, no man would probably feel himself entitled to conclude that male births are in any notable degree more dangerous than female; but this, as we have seen, becomes a demonstrable and strongly marked fact, when we direct our inquiries into the records of hundreds or thousands of carefully recorded observations.

ART. 111.—*On the Operation of Turning.* By Professor SIMPSON.

Edinburgh Monthly Journal, Feb. 1845, p. 116.

[Although the operation of turning is one which the obstetrical practitioner is frequently called upon to perform, the method of performing it as it would seem by the following remarks, which are selected from a clinical

lecture by Dr. Simpson, admits of considerable discussion. The author propounds the following queries]:—

Should we seize both feet of the infant, or only one? "Never be content," says Dr. Lee in his lately published 'Lectures on Midwifery,' "with one foot when it is possible to grasp both." In most cases I hold this measure to be improper and unjustifiable, because it is always more difficult to seize both extremities than one; because one is quite sufficient for our purpose, and more safe for the life of the mother; and because by pulling at one extremity we more nearly imitate the natural *oblique* position and passage of the breech of the infant, than when we draw more directly upon the same plane, by dragging at both limbs equally. Indeed, in no cases of turning is it proper or requisite to bring down both extremities, unless in the complication of turning under rupture of the uterus. In that case, and that only, should we follow that proceeding.

Should we seize the foot or the knee? I believe the seizure of the knee to be preferable in most, if not all cases; for the knee is more easily reached, and affords the operator a better hold. Moreover, turning by the foot appears to endanger a laceration of the uterus more than turning by the knee.

Which knee should be seized? On this point, you will find no direction in any modern obstetric works either British or foreign, as far as I know them; and yet I believe the secret of turning with facility and safety, after the waters are evacuated in particular, depends upon the knowledge of which of the two lower extremities of the infant should be seized. The one to be chosen is that which is *opposite to the side of the body which presents;* thus, if the right arm or shoulder presents, we should take hold of the left knee or foot, and *vice versâ*. I believe this rule to be one of essential importance.

[It is sometimes difficult for the operator to distinguish between a knee and an elbow; Professor Simpson gives the following rule for avoiding the mistake]:—Suppose the child to be lying, as it always does, doubled up, you may distinguish the elbow and knee from each other by the *opposite directions* in which they point. You have the convexity of the knee always looking upwards towards the head of the child, whereas the convexity of the elbow always points in the contrary direction.

Art. 112.—*On the Expulsion and Extraction of the Placenta before the Child.* By James Y. Simpson, M.D. F.R.S.E.

(*London and Edin. Month. Journal,* March 1845.)

All writers on Midwifery concur in the opinion that there is no circumstance more trying to the attendant, or more fatal to the parturient woman than the recurrence of hemorrhage from presentation of the placenta. So high, indeed, is the mortality arising from this complication, that one woman in three perishes from it, a fatality which is as great as that of cholera, and more so than that of the dangerous capital operations. Such being the case, any attempt, as in the memoir before us, to diminish the fearful risk attendant upon placenta prævia, is, in the words of the author, "at least entitled to the consideration of the obstetric profession, even should it fail to secure their concurrence and conviction."

The principles of treatment in cases of placental presentation hitherto pursued may be reduced to two:—that which has been supposed to be chiefly applicable in *partial* presentation, namely, rupture of the mem-

branes; and that which meets with more general approbation, and has been generally considered indispensable in severe "unavoidable hemorrhage," namely, turning. To these Dr. Simpson proposes to add a third—the *complete separation*, and *extraction*, if *necessary*, of the *placenta before the child.* He has been induced to offer this suggestion, from the circumstance, on one hand, that the most serious hemorrhage always occurs when the placenta is only partially detached; and on the other hand from the fact which he establishes upon the evidence of an extensive and well-arranged table of cases, "that when the placenta, in unavoidable hemorrhage, is once *completely* separated from its connexions with the interior of the uterus, the accompanying flooding in general entirely ceases, or becomes moderate in quantity." It virtually appears, from the examination of the table alluded to, that in 5 only of 111 cases in which the extraction of the placenta preceded the expulsion of the child, did the hemorrhage continue so profuse as to be considered alarming by the attendant.

Dr. Simpson displays the value of his new mode of treatment by a comparison of the mortality under it, and that which occurs under the usual method. It has already been stated that in unavoidable hemorrhage treated by turning the deaths are as 1 to 3. Among the 140 cases tabulated by Dr. S. 10 were fatal or 1 in 14. These figures, therefore, show a striking preponderance in favour of the new plan, but favorable as it is under this point of view, it becomes still more so by an investigation of the circumstances attending the death of the 10 fatal cases. Four of these died several days subsequently to delivery, so that they obviously did not die directly from the effects of hemorrhage; and in three others, one died from the consequences of her husband's brutality, and the two remaining from causes unconnected with the placenta, so that, as Dr. S. observes, in 141 cases the deaths are reduced to 3, or 1 in 47.

In the conclusion of this interesting paper the author draws the following deductions:—

1. That the *complete* separation and expulsion of the placenta before the child, in cases of unavoidable hemorrhage, is not so rare an occurrence as accoucheurs appear generally to believe.

2. It is not by any means so serious and dangerous a complication as might *à priori* be expected.

3. In nineteen out of twenty cases in which it has happened, the attendant hemorrhage has been either at once altogether arrested, or it has become so much diminished as not to be afterwards alarming.

4. The presence or absence of flooding after the complete separation of the placenta, does not seem in any degree to be regulated by the duration of time intervening between the detachment of the placenta and the birth of the child.

5. In 10 only out of 141 cases, the mother died after the complete expulsion or extraction of the placenta before the child.

6. In 7 of these 10 casualties, the death of the mother seemed to have no connexion with the complete detachment of the placenta, or with the results arising directly from it, and if we do admit the three remaining cases, which are doubtful, they would still only constitute a mortality of 1 in 47 cases.

7. On the other hand, under the present established rules of practice, the deaths in placental presentation are as high as 1 in 3.

Art. 113.—*On Galvanism applied tb the Treatment of Uterine Hemorrhage.* By Thos. Radford, m.d.

(*Provincial Medical Journal,* Dec. 1844.)

" Uterine hemorrhage is usually divided into that which takes place in the early months, and that which takes place in the latter months of gestation. The latter class is again subdivided into what are called accidental hemorrhages, unavoidable hemorrhages, and the after hemorrhages. Accidental hemorrhages are those which arise from accidental causes; unavoidable hemorrhages are those which arise from a particular location of the placenta in the immediate neighbourhood of the os uteri; and the after hemorrhages are those which take place after the delivery of the child, and they may occur either before or after the expulsion of the placenta. You will be also aware that there are a number of other uterine hemorrhages which are unconnected with gravidity; but it is my object in this lecture more particularly to dwell upon those discharges of blood which are connected with pregnancy in the latter months, and with labour. It is not my intention, on the present occasion, to enter into a full consideration of the subject, but more particularly to confine my remarks to that condition which is the result of profuse and long-continued bleeding, viz. exhaustion, a state highly interesting to the obstetrician, and which seems to me to require more than the recognized means for its management.

Now, we know that exhaustion may arise in all the varieties of hemorrhage; but we find that it is more especially produced by those impetuous and large discharges of blood which take place before, during, and after labour.

With regard to those cases of flooding, before and during labour, which have proceeded to a state of exhaustion, it has been the custom of many obstetrical writers to recommend the practice of delivery. Others have discountenanced delivery in this particular condition; and of course, where the principles of practice are unsettled in a case so important, it is very desirable that we should endeavour to discover some new method of treatment which shall place the question beyond dispute. Although such high authorities as Burns and Hamilton advocate delivery in these cases, it has always been my practice to recommend non-delivery; and if we were to analyse the cases that have been published in the reports of hospital and private practice, and those that have accidentally come to our knowledge, we should be startled at the immense loss of life arising from these extreme cases of hemorrhage, where delivery has been adopted.

Now, I regret to say, I believe that the great ruling influence upon the mind of practitioners, in determining them to deliver at all hazards in these cases, is the dread of popular opinion. It is usually stated that no woman ought to die undelivered; and where a woman does die undelivered, it produces a very considerable sensation, both in the neignbourhood and in the mind of every party who may come to a knowledge of the circumstances. On this account a practitioner dreads the procrastination of delivery, lest death should occur before it can be accomplished, and his character consequently involved in censure. Now it appears to me, that when a practitioner is thus placed, he ought to possess sufficient moral courage to resist the pressure of popular opinion, and be guided by a higher

principle in the discharge of his duty; and I am convinced that if the matter is fairly and dispassionately considered, it will be found that there is a great advantage in not delivering in these cases of exhaustion.

And first, with regard to the child, it is stated by the advocates for delivery, that there is the greater probability of its being saved by the immediate adoption of this operation, than by its delay. But if we take the pains to investigate the reports that have been published, as well as to examine into the results of the practice of private individuals, it will be found that the child is nearly always dead in these extreme cases. Therefore this consideration ought not to have much weight with us in deciding upon the principle of practice. And if we reflect upon the causes which give rise to hemorrhage, more especially in placenta prævia, we shall find sufficient reasons for understanding why the child should be generally dead. In the accidental species of hemorrhage, if the cause has been such as not only to lead to a separation of the placenta, but to something like a disruption or a wounded state of that organ, the death of the child is nearly inevitable; and in the unavoidable species, from the particular location of the placenta, if we recollect what must be the influence of labour upon the placenta itself, not only in producing detachment and a separation of its connexion with the sides of the os uteri, but also the mechanical influence applied by the child's head coming upon it, we must see that in this case there is generally more or less of a disruption and breaking up of its structure; and consequently the child dies from bleeding from its own particular system.

If we go into inquiries as to the influence of the death of the child upon the hemorrhage, we must look upon it as being rather an advantage to the mother, because it takes off a certain demand upon her blood, or lessens what Hunter calls "the stimulus of necessity," and therefore makes such a change in the balance of her circulation, as would be a means of checking, rather than increasing, the discharge.

We will now proceed to consider the question as regards the life of the mother; and when we are contemplating a subject of this kind, a woman placed under extreme circumstances of inanition or exhaustion, we ought not to ask, "Ought a woman to be delivered?" but, "*Can* a woman be delivered *safely?*" That is the question we ought to endeavour to settle in our minds before we proceed to the operation. If we have a woman already in a state of exhaustion from large evacuations of blood, we must be certain that a plan of treatment which, in any way, produces an unfavorable change upon the nervous and circulatory systems, must add to the evils already existing. We have here sufficient prostration; and the mere emptying of the uterus will most inevitably increase it. Every surgeon is aware of the influence that is produced by the operation of tapping in cases of ascites in men strong in comparison of some of these poor women, reduced as they are by the loss of so large a quantity of blood. Syncope, nay, even death, is sometimes the result of the abstraction of the ascitic fluid. We know also in some cases, and especially where there is a particularly exalted state of the nervous system, or some particular idiosyncrasy, that simple evacuation of the uterus, by the natural efforts, will produce death! This very change then has in itself a very unfavorable influence upon a woman thus prostrated. But, besides this, we must bear in mind that there must necessarily be a great demand upon their powers by the stimulus of forcible delivery.

There are a number of other circumstances which ought to be taken into account, as regards delivery. And one of the most important of these is the physical or structural impediment that may arise from a rigid os uteri. And when we come to the bedside of a patient, (I am sure every gentleman who has had much practical experience, will bear me out in this statement,) we shall find that some of those dogmas which are laid down in books are wholly untrue. I now refer particularly to that assertion of certain writers, who say, that by the evacuation of blood, the soft parts become so weakened and dilatable, that delivery can always be accomplished. This I most positively deny. And therefore I say that there are conditions of this kind which will be an obstacle to delivery.

The os uteri will continue *undilatable*, although the woman may be in such a state of exhaustion as to be literally tottering on the brink of the grave! It is true that this state of matters does not generally exist, but it is too frequent to be overlooked in determining our line of practice.

Again, we should be aware that hemorrhages take place, and produce this state of exhaustion, before the woman has progressed to that period of pregnancy that would justify a practitioner in having recourse to forcible delivery; and this is a point not sufficiently dwelt upon by obstetrical writers. In proportion to the early occurrence of hemorrhage, so will be the obstacles to delivery, as regards the introduction of the hand into the uterus. And when we are considering the chances of delivery, and taking into account the dilatable state of the cervix and the os uteri, we should never forget the length of the former as regards the particular period of pregnancy. And not only is this to be taken into account, but there is another circumstance which must not be overlooked, viz., the degree of subsidence of the uterus into the pelvis; for according as the uterus remains high in the pelvis, so we may be certain that the difficulties of delivery will be proportionate.

In all uterine hemorrhages connected with pregnancy, there are certain attendant circumstances, viz., separation of the placenta, with or without disruption of its structure; exposure of the large orifices connected with the uterine sinuses, rupture of the decidual vessels and atony of the uterus, which is either primary or secondary. The natural means for suppressing the discharge are the formation of coagula, and the contraction of the uterus. As to the adhesion of the placenta, when once separated, or the cicatrization of this organ when disrupted, the practitioner can place no reliance on them in checking the flooding.

With respect to the coagulation of the blood, it may become influential in arresting slight discharges, but never ought to be depended upon in those profuse hemorrhages which we are now more particularly considering. The coagula which form in the vagina, and which are stated to be so important in the suppression of the bleeding, may become indirectly an evil instead of an advantage, by deterring the practitioner from making a proper investigation of the case, under the idea "that the disturbance of these coagula is death." In my opinion, the coagula which are more particularly to be depended upon, are those in the immediate neighbourhood of the venous orifices that have been exposed, and I repeat that these are of no avail in the more serious cases; and therefore we must solely trust for the suppression of these large discharges of blood to that most important agent, contraction of the uterus.

The ordinary means of producing uterine contraction are so well known that I need merely refer to them before the present audience. We have the

bandage, friction applied briskly over the uterus, grasping pressure, secale cornutum, the application of cold, and, in the after hemorrhages, the introduction of the hand into the uterine cavity. But all these means may fail in producing this desirable change, and will fail and do fail in the extreme cases.

A fatal case having recently occurred in this town [Manchester], which produced a considerable sensation at the time, where delivery was adopted, contrary to the principles which I had always publicly inculcated in my lectures, I was led to investigate the arguments of those who advocate that practice, more closely than I had perhaps ever before done; and it struck me that we were deficient in a means on which we might always depend for inducing uterine contraction, and so placing the woman in such a state of safety that the operation of delivery might be deferred. Whilst my mind was so much occupied upon this subject, I was consulted by my friend Dr. Goodwin, in a case of protracted labour, where the long forceps were required. The lady recovered well, with the exception of not being able to pass her urine. We administered all the usual remedies for a fortnight or more, using the catheter twice, sometimes three times a day, but without the least amendment. Upon Dr. Goodwin's suggestion, we decided upon the application of galvanism, which was undertaken by him, and the result was most gratifying, for the first application proved permanently successful. The decided efficacy of this plan in restoring the energy of the bladder, immediately led me to conclude that it was the very agent that I have already stated was a desideratum to ensure uterine contraction in cases of severe flooding, attended with exhaustion. We have here a woman reduced by loss of blood, with an atonic state of the uterus, either primary or as the result of the discharge. Now, as the advocates of delivery (*vide* Burns and Hamilton) say that this proceeding gives the woman the only chance of living, because, so long as the uterus remains distended by its contents, and its parietes atonic, those large venous orifices which have been exposed by the separation of the placenta, are so situated, that the chances of further effusion of blood exist; it occurred to me that the application of galvanism would so effectually act upon the uterine tissue as to induce firm contraction of its fibres, and thereby at once lessen those large openings, and bring the walls of the uterus into firm apposition with the body of the child, so as to entirely close them. This great object having been attained, we might safely procrastinate the delivery, and adopt such means as would tend to raise the vital powers of our patient, such as the administration of opium, stimulants, and support; and the performance of the important operation of transfusion. With the uterus in this favorable condition, our restorative means, and particularly transfusion, would be far more likely to be attended with successful results, than if the organ were distended and atonic; for in this case, the blood which is introduced into the system, either directly by transfusion or indirectly by nourishment, produces no permanent benefit, because it is rapidly discharged again. Analogy further led me to believe that my conjectures would not prove unfounded, for galvanism is particularly impressive in its influence upon the muscles of recently-killed animals, and we know how strictly allied in action, if not in structure, the uterus is to muscle.

I mentioned my views to a number of medical friends, who generally much approved of them; and I was soon enabled practically to prove their correctness, by being called in consultation to a case of frightful hemorrhage during labour, attended with extreme exhaustion, and where the os uteri

was so rigid that the advocates of delivery could not possibly have carried their views into practice, without lacerating the os and cervix uteri. By this case I ascertained that galvanism produces an effective and powerful contraction of the uterus; and not only so as regards its tonic contraction, but it has also the power of energetically exciting alternate contraction when applied at intervals. I can tell you most seriously and most solemnly, that it produces these two important changes upon the uterus in such a degree as, in my previous reflections on the subject, I had no conception of. The alternate contraction excited by this agent is analogous to, and as powerful as, that which is observed in normal labour, and the tonic contraction is greater. I shall not relate cases in detail, because it would occupy too much time; but I may state that I applied galvanism in a case where the membranes were unruptured, and the uterus in a state of great inertia, and alternate contraction was immediately produced. Before this the membranes were very flaccid; but as soon as the galvanic circle was completed, they became extremely tense, and protruded low down into the vagina; and this state of tension did not subside when the alternate contraction ceased, as is observed in some degree in normal labour; for although the galvanic conductors were removed, so great a degree of tonic contraction of the uterus had been induced, that this membranous bag could not collapse.

I am thus satisfied, that by the application of this means, we can induce such a state of chronic contraction in the uterus, that, in these extreme cases of exhaustion from hemorrhage, the woman may be placed in such a state of safety, that delivery may be postponed until a time arrives when it can be safely accomplished, and in the meantime we can have recourse to those measures which tend to raise the vital powers.

I think it probable that it may also produce one of the other natural means of suppressing hemorrhage which I have already referred to, viz., coagulation of the blood; but this I have not yet positively ascertained by experiment, although I am led to conclude that such is the fact, from some remarks made by Dr. Apjohn, in the article *Galvanism*, in the *Cyclopædia of Practical Medicine*.

In my previous remarks, gentlemen, I must be understood to refer to those cases of hemorrhage where the placenta is not placed over or near the os uteri; but I shall now proceed to speak of those cases in which uterine contraction has a tendency to increase the discharge, cases which are usually described as belonging to the class, unavoidable hemorrhage. In these cases, where the peculiar location of the placenta deprives us of the benefits that usually accrue from uterine contraction, and as it is the special influence of galvanism to produce this effect, it ought to be the object of the obstetrician so to modify his practice, as to place them within the range of this remedy. Before entering upon a description of the plan which I would recommend to be adopted in these cases, I shall first direct your attention to the practice of the older writers; and secondly, refer to the mode in which nature sometimes terminates them when left to herself. In looking over the authorities from about 1612 to 1790, we find that they vary in their practice. Some recommend the removal of the placenta before the child; others advise the same course conditionally, that is, providing it is offering itself very largely or decidedly to the finger of the attendant; others again, say that where it cannot be pushed back, it should be brought away before the child. It must be understood that many of these writers had not a correct knowledge of the true anatomical condition of parts in cases of placenta prævia, and I do not think it requisite to enumerate their names,

as it would be occupying too much of your valuable time. You will find that in some of these cases, where the placenta was brought away before the child, according to the statement of these writers, the latter was even born alive, and in most of them the hemorrhage was suppressed. And whilst on this subject, I may call your attention to a few cases of more recent occurrence, where this practice has been adopted. It happened to me in 1819, to have a case of placental presentation, where I detached the placenta, because it was hanging down so low into the vagina, that there was no chance of doing anything else; the hemorrhage was immediately suppressed, and the child expelled by the natural efforts. I am also indebted to my friend Mr. Jesse, who is present, for the details of a case in which he detached the placenta, and in which the hemorrhage thereupon subsided. It was the practice of the late Mr. Kinder Wood, of this hospital, in many of these cases, to detach and bring away the placenta, and afterwards to leave them to the operation of nature, or to extract the child by the feet, as the case demanded. A case also occurred to Mr. Wilson, of this town, who kindly related the circumstances to me; the placenta had been rudely brought away by the attendant, and Mr. Wilson found the patient in a state of exhaustion, with the child still in utero. He extracted the child a considerable time after the removal of the placenta. It has occurred to me, in my hospital practice, to find that the placenta had been brought down in mistake by the midwives in these cases, and this without causing an increase of the flooding.

Smellie mentions cases in which the placenta was brought away, and where the hemorrhage subsided. In Dr. Collins's Reports of the Dublin Lying-in Hospital, there is a case in which the placenta was brought away by the midwife the evening before the admission of the patient into the hospital, and the hemorrhage was thereby suppressed. Baudelocque relates a somewhat similar case. And now let us consider the method in which nature sometimes terminates labours where there exists placenta prævia; and for this purpose I have, without any great pains, collected 36 cases, illustrative of her powers in separating and expelling the placenta before the child.

Giffard mentions one case; Perfect, one case; Smellie, four cases; Chapman, one case; Ramsbotham, sen., six cases; Merriman, one case; Hamilton, two cases; Collins, one case; Barlow, one case; Dr. Robert Lee, two cases; Gower, one case; Millington, one case; Bailey, one case; Wood, three cases; Lowe, one case; Hunt, one case; Wm. Lowe, three cases; Dorrington, two cases; and I have met with three cases of the same nature myself. Besides these, Mr. Jesse has related to me a case of placenta prævia, where the entire ovum was expelled; Mr. James Kenworthy, a similar case; and the late Dr. Rigby has published a case also. Now, the bulk of these cases, gentlemen, have been detailed without any specific practical object, and consequently are more valuable to my present purpose than if they had occurred to myself, and had been brought forward to serve my own particular views. You may refer to many of them yourselves; and you will find in nearly all of them that the hemorrhage was suppressed immediately after the placenta was thrown off.

These cases, then, and the practice already referred to, as adopted by the older writers, and several modern obstetricians, appear to me to furnish data of a most important character, whereupon a practice, adapted to cases of exhaustion from unavoidable hemorrhage, may be based, in order to bring them within the sphere of the application of galvanism. And before

entering upon a description of my proposed plan of managing these cases, I beg to remind you that it is an established fact, that partial separation of the placenta, whether in simple or in complicated retention of that organ after labour, or in placenta prævia, is attended with far more profuse bleeding than total separation.

In the earlier part of the lecture, I stated that one means of adding to the exhaustion already existing, is the evacuation of the uterus, whether that evacuation be partial or entire; therefore I consider that in these cases of placental presentation, it would be a decidedly important point of practice to draw off the liquor amnii *gradually*, as the first step in the management of the case. For this purpose I have somewhat modified Mr. Holmes's instrument for perforating the membranes, making the canula much larger, and having an oval aperture placed on each side near its open extremity. The entire instrument consists of a canula and trocar, which latter always lies concealed within the canula, by means of a spiral spring, except when pushed out by pressure on its button-like extremity. This trocar can be entirely withdrawn from the canula, so as to leave the latter free for the passage of fluid. Now I propose to pass this instrument through the placenta into the amniotic bag, and then remove the trocar, so that the liquor amnii may escape, a plan which I prefer to rupturing the membranes at the side of the placenta, because the water in the latter case would flow too rapidly, on account of the practitioner not being able to limit the size of the opening he might make; and also because by the plan now recommended, the integrity of the membranes being preserved, the placenta is thereby maintained in a better position for acting as a tampon against the open venous apertures when the head comes to press upon it.

In rupturing the membranes in the ordinary method, it is quite obvious that as the connexion between the membranes and placenta is broken, the latter is liable to fall down more or less into the vagina. Having thus drawn off the liquor amnii, the next step will be to introduce the hand into the vagina, then to pass the fingers to the edge of the placenta, and carrying them on between it and the os uteri, to sweep the hand round its whole circumference, so as completely to detach the placental mass, care being taken to avoid rupturing the membranes. We have now brought the case into such a state as to be within the influence of galvanism; for although this practice of detaching the placenta may be a means of suppressing the bleeding, yet it will not restore the depressed powers of the woman; and on that account we still require an agent to induce such a degree of uterine contraction as will secure her from all chances of further hemorrhage, while we have recourse to such measures as will tend to support her strength.

In order, then, to ensure uterine contraction, we must have recourse to galvanism, and the subsequent management of the case must be conducted on ordinary principles, such as supporting the woman by stimulants, nutritious articles of diet, and transfusion. The delivery should be deferred until the powers of the patient are so far rallied as to justify its being undertaken, however long the interval may be; and that mode adopted which makes the least demand upon her constitutional powers. It may happen that a repetition of the galvanic shocks may, after a certain period, induce such uterine action as will expel the whole of the contents of the organ; and if this should not happen, it appears to me that it would be the best practice, to apply the long forceps, having previously removed the placenta, that is if the head presents. If any other part of the child presents, the case must be managed on ordinary principles.

The novelty of these views may produce an impression unfavorable to their proper estimation, but I hope, gentlemen, you will recollect that it has been my object to bring them before the profession in order that their correctness may be tested. I wish to benefit poor suffering women in their hour of danger, and to be candid in my communications to my professional brethren. In my own mind I am satisfied as to the influence of galvanism, and its power of producing uterine contraction. I am also convinced that it has no evil influence on the life of the child in utero, and after its birth that it is an important means of resuscitation in cases of asphyxia. Objections may be raised that we have not always the apparatus at hand. The answer to this objection is the same as that which refers to the application of all instrumental means. In my opinion, no gentleman who possesses the principles of a correct obstetrician, would carry his forceps, vectis, perforator, crotchet, or transfusion apparatus along with him. These things are to be sent for in emergencies only, and the same remark applies to the galvanic apparatus.

My remarks have hitherto been confined to the treatment of those cases of hemorrhage that are attended with exhaustion before delivery, but there are other cases to which galvanism is equally applicable. If we investigate the cases given by authors, we shall find that there are many cases of accidental hemorrhage before delivery, where artificial rupture of the membranes has not succeeded in arresting the discharge, on which account several writers, Burns and Hamilton amongst them, advocate delivery in preference to this operation. Now, the artificial rupture of the membranes is recommended for adoption without reference to the condition of the os uteri; and it must be obvious, if this part is rigid and undilatable, and the flooding should continue although the membranes have been ruptured, that it would be highly hazardous to introduce the hand and to deliver by force. In such a case galvanism would place the woman in a state of security, by exciting the contraction of the uterus. I also consider that this power would be useful in some of the hemorrhages of the early months of pregnancy.

With regard to the after hemorrhages, especially those attended by exhaustion, I consider it particularly applicable where atony of the uterus is the principal feature of the accident. In those cases which occur previous to the expulsion of the placenta, it would be the duty of the practitioner to assure himself that this mass was not morbidly adherent to the sides of the uterus.

In hour-glass contraction, and other forms of irregular uterine action after labour, I anticipate great benefit from its use. In these cases there is a loss of balance between the contractile power of different parts of the uterine fibre, one part being in a state of atony, whilst the other is in a state of firm contraction. Now, if the galvanic current be directed in the longitudinal axis of the organ, it strikes me that you might excite the longitudinal fibres to contraction, and thereby restore the balance.

There are several other topics not directly connected with the subject of this evening's lecture which I shall slightly notice, in reference to galvanism. I am satisfied from positive trial of the remedy, that it will be found a most important agent in tedious labour, depending upon want of power in the uterus, and where no mechanical obstacle exists. I would also suggest the probability of its proving valuable in originating uterine action *de novo*, in cases where it may be considered necessary to induce premature labour. It seems to me also to be worthy of trial in certain cases of menorrhagia in the ungravid state, where, on vaginal examination, the uterus is found to be

atonic, as evidenced by its large flaccid condition, and the patulous state of the os uteri.

Having made this digression, it is proper that I should remark, in reference to cases of hemorrhage, that I am not urging this plan of treatment upon the profession, with the view of superseding the ordinary means, but rather with the view of supplying a remedy in those extreme cases where these have failed. I do unhesitatingly say that the obstetrician has the power in most cases to control uterine hemorrhage, so as to prevent them ever reaching this extreme state of exhaustion. But, nevertheless, we do meet with this condition, frequently in a large hospital practice, and also in private consultation practice. A number of cases have come to my knowledge within a very few months, where death has resulted from this excessive exhaustion. I therefore say that we ought to have some more certain means than delivery to depend upon in these cases; for, if this expedient be so important a means of saving life, how is it that it so often fails?

With regard to the mode of applying galvanism in these cases, I have used an electro-magnetic apparatus, contrived by Messrs. Abraham and Dancer, of this town, for medical and other purposes. It consists of a battery in a small jar, and a helix with conductors. For the sake of convenience, the latter are connected with the helix by means of long wires covered with an isolating material. The strength of the shock is regulated by a small contrivance situated on the stand of the helix, by means of which it can be either diminished or increased. One of the conductors, which is applied externally, has a hollow wooden handle, through which passes the wire before alluded to, in order to join a brass stem terminating at its extremity in a ball. The other conductor, which is contrived by myself, consists of a strong brass stem, seven inches long, curved to suit the vagina, and covered with a non-conducting material, having a small screw at its distal extremity for attaching it to a silvered ball; at its other extremity it is received within an ebony handle, which is hollow, and through which passes a strong brass wire, looped at the end, and connected with the long wires before alluded to. This wire is kept disconnected from the brass stem by means of a spiral spring concealed within the ebony handle. The loop is covered with silk, and is intended for the thumb of the operator, when he is bringing the wire into connexion with the stem.

When the remedy is applied, the brass ball of the vaginal conductor is to be passed up to the os uteri, and moved about at intervals, on to various parts of this organ. At the same time the other conductor must be applied to the abdominal parietes over the fundus uteri. Shocks may be also passed transversely through the uterus by simultaneously applying the conductor on each side of the belly.

The application should be used at intervals, so as to approximate in its effects as nearly as possible to the natural pains. It may be continued until it meets the exigencies of the case."

Art. 114. *On Compression of the Abdominal Aorta in Uterine Hemorrhage.* By M. Sentin.

(*Bulletin de l'Académie de Méd. Belgique.*)

[After some general remarks upon the nature of the hemorrhages which occur after childbirth, and respecting the history of the above operation, the author thus describes the process adopted by himself]:—" The woman

is to be placed on a horizontal plane, with the head and shoulders raised, and the thighs flexed upon the pelvis, in order to relax the abdominal muscles as much as possible, and to avoid the mechanical engorgement of the uterine vessels. The surgeon, placed on the right side of the patient, uses the left hand to compress the vessel, keeping the right disengaged for any other purpose which the case may demand.

"The intestines being pushed on one side by gentle manipulation, the three fingers of the left hand are pressed firmly and deeply behind, and to the left of the uterus, nearly on a level with the umbilicus. By this plan the aortic pulsations will be evident, and further pressure is then to be made in a direction downwards and backwards.

"In order that the operator may not be too much fatigued by continued exertion, his hand may be compressed by those of an assistant."

Art. 115.—*Case of Metro-Peritonitis from Rupture of the Vagina, in which the Matter was evacuated by an opening in the Loins.*

By M. Graus.

(*Bulletin de l'Acad. Roy. de Méd. Belge*, t. ii, p. 656.)

This almost incredible case occurred in the person of a female, æt. 44, who had borne five children. Her last labour occurred in May 24th, the infant being dead. The labour was natural, but was followed quickly by profuse hemorrhage, and in 30 hours by severe abdominal symptoms. Upon examination per vaginam, a laceration was found at the left anterior wall of the vagina; which was supposed by M. Graus to communicate with the peritoneum. In order to ascertain this fact, he introduced through the laceration an œsophageal tube, which penetrated without difficulty as far as the hypochondriac regions.

The patient was bled three times without benefit, when it occurred to M. Graus to inject the abdomen through the laceration, in order to favour the escape of the purulent fluid. This operation was repeated several times without material benefit, but, on the contrary, the patient became daily more exhausted by the occurrence of cellular abscesses in various parts of the body. Hectic and diarrhœa were now added to the rest of the symptoms, when M. Graus, under the impression that there was an accumulation of pus in the lumbar region which could not be made to escape per vaginam, decided upon making an incision in that situation. This was accordingly done, and gave issue to a large quantity of matter similar to that which passed below. When the injections were used, as before, through the vaginal rent, the fluid injected passed in a full stream through the lumbar opening, thus clearly proving the continuity of the suppurating cavity in the loins.

A few days after the opening was made in the lumbar region, the suppuration was much diminished, but the patient became greatly depressed by the formation of a fresh abscess in the thigh, and by the escape of fecal matter through the lumbar opening. The latter symptom, however, ceased at the end of twelve days, from which time recovery took place without any further drawback, and the patient was discharged, cured, at the end of ten months.

Art. 116.—*On the Nature and Causes of Puerperal Convulsions.*

By W. Tyler Smith, m.d., London.

(*Lancet*, Dec. 7, 1844.)

[In attempting to apply the physiology of the spinal marrow to the explanation of the mystery which has hitherto surrounded the subject of puerperal convulsions, it may not be uninteresting to give in the first instance the current opinions of the most eminent authorities respecting the nature and causes of this terrible disease. The following extracts contain the most recent views which have been advanced on the subject] :—

"The most usual proximate cause of puerperal convulsion is probably *pressure on the brain*, the pressure being sometimes produced by the rupture of a vessel; sometimes by serous exudation into the ventricles; sometimes, and by far the most frequently, by simple congestion of the cerebral vessels themselves. . . . . Into the remote causes it is not my wish to enter at any length, because the subject is at least but unsatisfactory and ill understood. . . . . The affection in my opinion originates most commonly in some deranged state of the uterus itself, and consists in some *irritation propagated from that organ to the brain.*" (*Ramsbotham's Principles of Obstetric Medicine.*)

"The exciting cause of eclampsia parturientum is the irritation arising from the presence of the child in the uterus or passages, or from a state of irritation thus produced continuing to exist after labour. The predisposing causes are general plethora; the *pressure of the gravid uterus upon the abdominal aorta;* the contraction of that organ during labour, by which a large quantity of blood circulating in its spongy parietes is driven to the rest of the system; constipation; retention of urine; previous injuries to the head, or cerebral disease; and much mental excitement." (*Dr. Rigby, Library of Practical Medicine.*)

"Convulsions of the kind I am considering are evidently connected with gestation or parturition, they occur at no other time, and are most common in a first labour. They arise particularly from uterine irritation, but also seem frequently to be connected with a neglected state of bowels. . . . The sympathetic irritation is almost invariably accompanied by an affection of the vascular system productive of great determination to the head, either directly or indirectly through the medium of the spinal nerves, which aggravates the evil, and indeed, becomes the chief source of danger. I am inclined to think, that in the majority of cases, the *spinal cord* is first affected by the state of the uterine nerves, and immediately afterwards the head suffers. . . . On inspection after death we sometimes find turgescence of the vessels of the brain, but very often no mark of disease is to be discovered elsewhere." (*Burns's Midwifery.*)

"Those women are most predisposed to the disease who have had epilepsy or hysteria in early life, who have suffered from injuries in the head, or who have had violent attacks of fever or severe affections of the brain. . . . There are many cases in which the peculiar condition of the nervous system of the uterus appears to be the sole cause, and in all cases it is the principal predisposing cause, for the fits of convulsion occur in most women in the first pregnancy and labour; and they often suddenly cease when labour is completed, after every remedy has been employed without avail, except artificial delivery. *The condition of the brain upon* which

the loss of consciousness and convulsions depends, is obviously produced by sympathy with the nervous system of the uterus; and the fits return and increase in violence, until the uterus is emptied of its contents." (*Dr. Lee's Lectures on Midwifery.*)

"The immediate causes of puerperal convulsions are often very obscure. They appear *to depend upon a loaded state of the vessels of the brain;* at other times the brain appears to be influenced by distant irritation, either in the uterus or the digestive organs. The immediate attack may be brought on by a loaded or disordered stomach, or by food of an indigestible kind. . . . The violent straining caused by labour-pains, and even the disturbance of the frame by the earlier uterine contractions causing *a temporary rush of blood to the head*, will sometimes bring on convulsions." (*Dr. Locock, Cyclop. Pract. Med.*)

[Having endeavoured to show by these extracts the great discrepancy of opinion which exists, the author enters more directly into the subject of his essay, which is to demonstrate that puerperal convulsion is a purely excito-motory phenomenon. He particularly inculcates the necessity of a clear recollection of the anatomy of the nervous system, in order to understand the position which he is anxious to establish. "We are bound," he observes, "to consider the medulla spinalis and oblongata, with the corpora quadrigemina as forming together one distinct organ; as being a division of the nervous system which is to be looked upon as separate from the brain, cerebellum, and sensory and voluntary nerves." That this is a correct view of the matter has long been determined by actual anatomical proof, by both Dr. Carpenter and Mr. Newport, who have distinctly ascertained that in the invertebrata the excito-motory cord is anatomically distinct from that subservient to sensation and voluntary motion. The author thus proceeds]:—

Let us now examine some of the presumed causes of puerperal convulsion, and first of cerebral congestion. During the puerperal state there is a greater tendency to vascular fulness than at other times, and in some of the stages of labour, the plethora more particularly affects the head. In the second stage of labour, when the passage of the fœtal head through the vagina excites the reflex action of the expiratory muscles, there is during each pain partial or entire closure of the glottis. This interferes with the circulation, and the remove of blood must affect the upper portion of the spinal marrow, although the fact has escaped the notice of writers on the subject.

It would follow from the above, that if simple pressure on the cerebral vessels caused convulsions as often as is supposed, the convulsions ought to occur most frequently during the second stage of labour. But this is not the fact, and, therefore, of itself is sufficient to overturn the generally received opinion as to the *cause* of the convulsions. There is too great a tendency to consider any change discovered after death as the *cause* of the disease during life, so in puerperal convulsions it has been usual to examine the brain, and to record all the lesions there displayed as *causes* of the disease. Yet, how, in a case of convulsion following afflicting intelligence, can the effusion into the ventricles which is found after death, be considered to have caused the convulsion. The patient falls into the fit *instantly;* she recovers her sensibility, but the fit is repeated and she expires. In such a case the *emotion* is the *cause*, the effusion is the *effect* of the disease.

In thus attempting to set limits to the influence of the brain in convulsive diseases, I do not deny that effusion of blood or vascular congestion, particularly in the second stage of labour, does occasionally cause puerperal convulsion, but such instances are not sufficiently common to justify the general theory. Further, in these cases, it is not the *brain*, but the *spinal marrow* which produces them. Mere irritation of the brain as shown by direct experiments, does not produce convulsions; in order to induce them, the upper part of the medulla oblongata must be irritated.

Another cause of puerperal convulsion of the centric kind is hemorrhage. When violent flooding occurs, death usually takes place by convulsion. These convulsions depend upon the effects of loss of blood on the spinal marrow, and not upon the brain. So we see after an ox has been felled, and the functions of the brain destroyed, convulsions come on when the animal is bleeding to death.

When emotion is the cause of puerperal convulsion, the mental affection operates, as has been shown by Marshall Hall, through the medium of the true spinal system. The motion becomes as clearly the excitor of the spinal marrow, as does irritation of a peripheral nerve.

These are instances of the *centric* causes of puerperal convulsions: let us now consider those of *eccentric* origin, those caused by irritation of incident nerves, the motor nerves being excited through the medium of the spinal marrow. First in importance, is *irritation of the uterus itself, and of the uterine passages*. The statistics of labour show that convulsions are relatively more frequent in head presentations, from which it has been inferred that pressure on the os uteri was the principal cause. But it is more probable that irritation of the vagina is the real cause. Convulsions are, however, often brought on by the mere presence of the fœtus in utero, there being no other exciting cause.

Irritation of the bowels is well known to cause convulsion, in other than the puerperal states. Thus, worms, indurated fæces, drastic purgatives, will cause epilepsy, or the convulsions of children. It cannot, therefore, be wondered at, that when the excito-motory system is under the additional stimulus of pregnancy or labour, that similar sources of irritation should cause puerperal convulsions. Gastric irritation and irritation of the bladder are also undoubted though less frequent causes. In conclusion, it may be stated that labour is a function of the excito-motory system, and the true puerperal convulsion can only occur when the central organ of the system, the *spinal marrow*, has been acted upon by an excited condition of an important class of its incident nerves, namely, those passing from the uterine organs, such excitement depending on pregnancy, labour, or the puerperal state. While the spinal marrow remains under the influence of these stimuli, convulsions may arise from two series of causes; those acting primarily on the spinal marrow, or *centric* causes, and those affecting the extremities of the incident nerves, causes of *eccentric* or peripheral origin.

The first include:—1, loss of blood; 2, pressure from congestive effusion, &c.; 3, asphyxia from closure of glottis; 4, emotion.

The second class comprehends:—1, irritation of uterine incident nerves; 2, irritation of incident spinal nerves of the rectum; 3, irritation of the incident gastric fibres of the pneumo-gastric nerve; 4, irritation of the vesical branches, and those of the surface of the body.

ART. 117.—*On the Effects of Ergot of Rye on the Parturient Female and her Offspring.* By SAMUEL HARDY, M.D.

(*Paper read before the Dublin Obstetrical Society. Dublin Journal,* May 1845.)

[Long as has been the practice of administering the secale cornutum as an obstetrical medicine, its effects, both salutary and the reverse, are far from distinctly ascertained. The object of the communication, which we shall here condense, is that of rendering our knowledge upon the subject more precise. In carrying out this object, the author investigates the action of the medicine under the following different points of view]:—

1. *As to the time the action of the ergot on the uterus commences.* From certain tables, this time appears to be in some cases as early as seven minutes after its exhibition, while in others a much longer period is required; the average time appears to be about ten or fifteen minutes. The author considers that it has always commenced within twenty-five minutes at the furthest, when the child has been expelled alive. On the other hand, if a longer time than this has elapsed, instruments have been necessary, and the infant has been born dead. The beneficial action of the ergot is evidenced by the pains running into one another without any appreciable interval.

2. *Effect on the maternal pulse.* This part of the inquiry is one of considerable interest, and has not received the attention from practitioners that it deserves. In nineteen cases recorded by the author, there was a marked diminution in the frequency of the mother's pulse, after the administration of the ergot; and this effect generally commenced within fifteen minutes of its exhibition. In all cases in which the maternal pulse was affected, the fœtal heart underwent a corresponding change. Here a practical question naturally arises, Is ergot a safe remedy in relaxation of the uterus, when the woman is reduced by previous hemorrhage? [The author does not give us any decided reply to this question, but contents himself with allusion to a single case in point, in which alarming prostration followed its exhibition.]

3. *The effects of ergot on the fœtal heart.* This is said to be still more remarkable than the effect upon the maternal pulse, and therefore demands serious consideration. By reference to the tables, it will be found that in the majority of cases a diminution in the pulsation of the fœtal heart, followed the exhibition of ergot. The period at which this commences does not differ from that previously noticed, namely fifteen minutes; the most usual effect noticed by the author is a diminution, in the first place, of the frequency of the pulsations, which is succeeded shortly by irregularity in the beats, or complete intermission. The author here states a practical fact, deduced from his own observations, to the effect that the child is generally lost, however speedily the delivery be completed, if the pulsations of the fœtal heart are reduced below 110, and at the same time become *intermittent.* The intermissions are a point of great importance in this statement, for the reduction of the pulse below 110 without this concomitant is not necessarily a fatal symptom.

Many different opinions have been broached as to the modus operandi of the ergot in destroying the life of the fœtus, some attributing it to the powerful compression exercised by the uterine walls, others to a specific poisonous effect of the medicine. The author thinks that each opinion may,

to a certain extent, be correct, but leans evidently to that which attributes it to the poisonous qualities of the ergot.

The depressing effects of ergot upon the fœtal heart are so great, that a considerable time elapses after birth before the child can be restored. The author has observed that children equally weak are restored to animation with much less difficulty when ergot has not been given.

The author, in alluding to the proper time at which the ergot should be given for the purpose of restraining or preventing "post partum" flooding, states, that there are three periods at which the medicine may be administered;—first, when the head is about to pass; secondly, after it has been expelled; and thirdly, as soon as the index-finger can reach the insertion of the funis into the placenta.

4. *The state of the uterus and lochial discharge*:—After the use of ergot, the uterus has frequently been found much larger than in ordinary labours, as has been remarked also by Dr. Johnson. The lochial discharge was sometimes pale and scanty. The children which are born alive usually do well.

The mode of administration of the ergot varies with different practitioners. The plan adopted by the author is to infuse half a drachm of the powder in three ounces of boiling water, and after straining to add ten or fifteen grains of fresh powder with a little sugar. This dose is repeated in twenty minutes, and if the uterus does contract well is given a third time.

[This interesting paper concludes with five tables arranged under the following heads:—1. Cases in which, after the exhibition of the ergot, the labour was terminated, the children being alive, by the uterine efforts *alone*. 2. Cases in which the children were born alive, but the application of the forceps, or vectus, became necessary. 3. Cases in which the uterus expelled the children still-born. 4. Cases where still-born children required instrumental extraction. (pp. 224—248.)

Art. 118.—*On Ergot of Rye.* By Dr. Parola.

(*Dublin Journal*, Jan. 1845.)

The essay from which the following extracts are made gained the prize at the Scientific Meeting of Italy, held at Lucca. The author, in reply to the several questions put to him, observes:—1. That the ergot is common to other grasses besides the rye, as *festuca elatior* and *lolium temulentum*. 2. The mode of action of the ergot of rye is common to similar degenerations in other grasses. 3. The ergot of rye possesses a powerful action on the animal system, whether we regard it in a physiological or a pathological point of view; its effects as to regularity and durability are in direct proportion to its dose, and the activity of its preparation. 4. It acts both upon the nervous and vascular tissues of the uterus, the latter, however secondarily. 5. It may be administered—

a. In every period of labour when the uterine contractions are too weak, and particularly when the cervix is obliterated and the os dilated.

b. When convulsions supervene, which suspend or interrupt parturition.

c. When there is uterine hemorrhage, or when the woman has been liable to it in former accouchements.

d. In certain cases where the fœtal head is of considerable size, and the pelvis neither deformed nor abnormally contracted, and the natural efforts are insufficient.

e. When the fœtus is evidently dead, and there is reason to fear serious consequences to the mother should she remain longer undelivered.

The exhibition of ergot is injudicious under the following circumstances: 1st. When any obstacle renders the passage of the fœtus impossible; when it is of monstrous size; when there is rigidity of the os or cervix uteri, or of the vagina and perineum. 2d. It is injurious in those cases in which labour is impeded by a true atony, or complete sinking of the uterine and vital powers.

Art. 119.—*On some of the Consequences of Undue Lactation.* By Dr. Ashwell.*

[The exhaustion induced by prolonging suckling is one of the most frequent forms of debility which we are called upon to witness in hospital or other practice among the poorer classes of the community. The more ordinary effects of this mistaken and mischievous habit, such as feebleness, loss of appetite, sinking at the stomach, pain in the back, leucorrhœa, &c. are sufficiently familiar to all, but there are other and more rare consequences which the practitioner will do well to bear in mind. The subject is admirably handled in the work from which we are about to quote, as the following extracts will evince]:—

"*Functional amaurosis,* accompanied by congestion of the conjunctiva, is a frequent result of excessive lactation, and seldom fails from its interference with the sight to arouse the patient's fears lest vision should be entirely and permanently lost. These apprehensions may easily be allayed, as doubtless in a great number of cases prompt weaning will alone remove the affection; still it may be necessary repeatedly to apply small blisters near the eye and to forbid its employment. Improved diet, country and sea air, exercise out of doors, iron and quinine, are important remedial auxiliaries. Nor is it unimportant that quickly-returning pregnancy should, if possible, be avoided. I have known several instances where, during a pregnancy immediately succeeding the exhaustion from over-nursing, the eye has been almost constantly "blood-shot," and the sight excessively imperfect. Specks and slight ulcerations of the cornea, are occasionally connected with the exhaustion and irritability of nursing. In all these cases, provided there be no serious organic change, the patient may be encouraged to expect the restoration of this 'invaluable faculty.'

"Several examples of *jactitation* have fallen under my notice. In one poor woman, an out-patient of Guy's Hospital, the seizures always occurred after she had nursed for three or four months; and they were so violent that she was compelled to lay down her baby when they occurred, lest she should let it fall. In another young and hysterical patient, who had borne children very quickly, there was during lactation, a continual and slight twitching, almost universal throughout the extremities, but especially in the face. In both, weaning was necessary before the sixth month, more on account of the leucorrhœa and general irritability, than for the jactitation.

"*Epilepsy* has been noticed by authors as the product of over-suckling, on the same principle as inanition, losses of blood, and deficiencies in its quantity and quality are known to be productive of this malady; I could adduce several instances where fits difficult to be distinguished from decisive and unquestionable epilepsy have occurred.

* On the Diseases peculiar to Females. Part III. 8vo. 1844.

"*Insanity*, more or less permanent, may originate in over-lactation, commencing by peculiarity of sentiment, or temper, and plainly evinced by pertinacious adherence to an opinion once formed, however erroneous; and scarcely at all more strikingly displayed than in a determined opposition to any advice having for its end an entire or even partial weaning. In this early stage, the further advance or the protracted continuance of the malady might be prevented; but instead of weaning, large quantities of wine or porter, with animal food, are resorted to. Still the desired supply is not obtained. The stomach being weakened, is scarcely able to bear the increased diet, and fever and indigestion, and apparent, not real strength, are the consequences. Together with a sparing secretion of milk, the symptoms already described become aggravated. The insanity becomes positive and acute, the pulse quick and sharp, the skin parched, and the whole system deranged. The condition of the patient is no longer doubtful; her actions are often violent; and without personal restraint, serious, perhaps fatal injury might be done to herself or others. I agree, however, with Dr. Locock, that the aberration of undue suckling is rarely of this serious kind, unless where generous diet and wine are injudiciously administered; more commonly it shows itself in weakness, and absurd ideas, in whim and in caprice. In this stage, if weaning and careful treatment be adopted, the symptoms often subside easily and quickly; while in other cases, where probably a disposition to insanity is hereditary, the disease is of longer duration, requiring seclusion and confinement for its cure. If it be asked whether permanent insanity is ever the result of undue suckling, I confess that I am unable satisfactorily to answer the question. In my own practice such has never been its consequence; nor so far as I know have I discovered an example of the kind. The exhaustion of over-nursing induces the reaction and irritability on which the malady depends, and as this is gradually removed by the formation of a larger quantity of better blood, the insanity passes away, and the individual slowly recovers her lost reason. It may, perhaps, be said by those who regard this malady less seriously, that the insanity would have occurred independently of its intervention; the appended cases negative such an opinion. Additional confirmation is also furnished by the result of protracted lactation after another confinement. If, after such an event, more especially if the interval between the deliveries has been short, and the suckling be again protracted, a similar aberration will probably ensue, indicating the propriety of greatly curtailing the time of lactation, if not of entirely giving it up.

"It is not difficult to show many points of resemblance between this form of insanity and puerperal mania; this latter most commonly occurs in women of weakly, hysterical and irritable habits, and in the same class over-lactation is most frequently witnessed. In the greater number of examples of puerperal insanity, a modified antiphlogistic treatment only, comprising small local bleedings, cordial aperients, particular sedatives, with animal nourishment and tonics is most successful. The same may be said of over-lactation. Puerperal aberration is rarely permanent, if insanity be not hereditary, and if improper treatment has been avoided. The same observations are true of the insanity of over-lactation. The former is disposed to recur in after-confinements, and the latter will show itself afresh, after successive and injudiciously protracted nursings. There is, however, a marked difference in the frequency of the two diseases, the shock of parturition, the suddenness of the transition from pregnancy to the puerperal state, and the establishment of lactation itself, all of which

involve considerable changes in the circulation and in the nervous system, sufficiently account for the prevalence of the one malady over the other.

"The *pathology* of these functional results of undue suckling, is by no means intricate or doubtful. An impaired and attenuated condition of the blood, and a consequently depressed state of the nervous system, especially of the organic system of nerves, is the clue by which all the symptoms may be unravelled." (Pp. 725-28.)

Edin. Monthly Journal, April 1845.

ART. 120.—*On the Diet of Infants.* By T. STEWART, M.D. New York.

(*Dublin Journal*, March 1845.)

It is a rare event to have the secrets of the digestive process unravelled, revealed, and subjected to the test of actual experiment during life, or on a post-mortem examination. The former has been exhibited in the case of the patient of Dr. Beaumont. Of no less value are the results of post-mortem investigations of children performed by M. Guillot, for the purpose of ascertaining the condition of the contents of the alimentary canal of those infants which died under the use of the ordinary hospital diet. It is the custom at these, as well as in similar institutions, whenever an infant is sick, to withdraw it from the breast, and to substitute for it some farinaceous substance, made fluid by boiling. In the reports of the Hôpital des Enfans Trouvés, and des Enfans Malades, prescriptions of this nature form an important part of the treatment. The attention of M. Guillot being directed to the changes which the food given to children underwent, and to the excessive mortality among them, he instituted a series of investigations, with special reference to the state of the contents of the bowels. He was struck with the uniform occurrence of a jelly-like substance, both in the large and small intestines, which was proved to be starch, by its striking a blue colour with iodine.

Here we have a direct proof of the deficiency of the digestive power, the article given for food having undergone very little change, and therefore acting as a foreign body. From this fact, it appears to be the most rational course to pursue, to preserve as much simplicity as possible in the diet of infants. If in health, when digestion is unimpaired, animal food is most proper for an infant, in disease there can scarcely be any alteration to food of an entirely different character without incurring some risk. It is not my intention to assert that no alteration whatever is to be adopted, and because one kind of food is provided for the infant, that it would be hazardous to depart from it under any circumstances; such a course would be to discard all sound theory, and to abandon all attempts at controlling disease. In the case of infants, we can, without removing them entirely from the breast, avail ourselves of the mild and unirritating effects of substances of the same nature as that upon which the infant feeds. One reason generally assigned for the adoption of vegetable mucilage, as arrow-root, &c. is, that it is a soft and soothing application to the delicate or inflamed mucous membrane. Now if the same object can be attained by any substance which possesses the same bland qualities, and is also of the same nature of the infant's food, there will be no necessity for resorting to so highly indigestible as those of a vegetable nature.

With these impressions, it has been for years my practice to recommend a thin mucilage, a jelly made from isinglass, in the treatment of infantile diseases when soothing and unirritating food is indicated, in preference to

the use of arrow-root, and with uniform advantage. It rarely happens that acidity, and other evidences of imperfect digestion, arise to any great extent when this is used; and from the appearances of the alvine discharges, it would seem that it is completely digested. Since the adoption of this species of diet, I have not had an opportunity of testing for undigested starch, in the evacuations from undigested food; for such are the benefits which have resulted from the use of animal jellies, in cases of inflamed mucous membrane of the stomach and bowels, that nothing could induce me to substitute anything for it.

ART. 121.—*On the Distinction between Infantile Diseases depending upon Inflammation and those which arise from Irritation.*

By P. HOOD, Surgeon, &c.*

The importance of distinguishing between the symptoms of inflammation and irritation cannot be too strongly urged. Every practitioner must have experienced the disappointment which sometimes attends his best endeavours to relieve a suffering child, and been apprehensive of his remedies, more especially when he has had any doubt as to the cause of the disease. But by bearing in mind that morbid irritation exerts a powerful influence over the diseases of children, then treatment becomes more simple, and greater confidence is acquired. This consideration will in a great measure prevent the very common occurrence of the prostration of the strength of the child, at the onset of its disease, by the use of exhausting and lowering remedies. It will lead the practitioner to observe that children's diseases are not so speedy in their termination as is generally supposed, and that where he has hesitated to abstract blood, and has used more lenient means he has been rewarded; that the child, so far from sinking from want of bloodletting, has not only survived, but has proceeded rapidly to recover its health; while under contrary treatment, if it survived at all, its convalescence has been slow and protracted.

The practice of bleeding and leeching is inadmissible in diseases having their origin in morbid irritation. The only instances in which I have ever observed bloodletting and leeches borne with comparative impunity as remedies for what are termed the inflammatory diseases of childhood, have been at the earliest period of the attack, and when the greatest possible care has been taken to limit the quantity of blood taken. But even in these cases I have observed that the children long looked pale and sickly, and that some of them sunk under a renewal of the disease, to which the treatment adopted appeared to render them more liable.

The treatment most successful in allaying irritation comprises emetics, sedatives, and stimulating embrocations, when the lungs are attacked; sedatives, and aperients of a well-regulated strength, with febrifuge medicines when the brain is the seat of the disorder.

ART. 122.—*On Gastromalacia Infantum.* By Dr. LION, of Breslau.

(*Casper's Wochenschrift*, No. 34, in *Schmidt's Jahrbücher*, vol. 46, No. 291.)

It is impossible to define gastromalacia pathognomonically, because it is not so much a special disease, as the result of some other disease on the quality of which it is dependent. This softening or perforation of the sto-

* Practical Observations on the Diseases most Fatal to Children. London, 8vo.

mach, which we call gastromalacia, arises in two ways: it is either *acute*, as a consequence of *gastritis*, which is the rarer case; or *chronic*, as the result of some permanent affection of the nutritive organs in children. 1. In the first case, the child has either been for some time peevish and uneasy, or becomes so on a sudden, writhes and bends itself double, screams on the slightest contact with its stomach, which is hot, distended, and sensitive, has no appetite, throws up everything, and even vomits without having eaten anything, has violent retchings, is generally constipated, passes little or no urine, and that very hot and red, is tormented with a ceaseless thirst, has a small, hard, and rapid pulse, has cold limbs, and betrays even in its countenance an appearance of deep suffering. As the disease proceeds these symptoms grow more intense, and death often supervenes unexpectedly in the midst of convulsions. In some few cases a favorable crisis is brought to a happy result by means of purgatives, diuretics, and sudorifics, when the immediate cause of the disease is a faulty diet or cold. If the malady does not terminate either in death or complete recovery, the coats of the stomach are softened in consequence of the flabbiness of the membrane of the stomach which takes place in childhood, just as under similar circumstances in adults on account of the greater rigidity of the membranes and muscles of the stomach, *scirrhus* develops itself. The usual causes of this disease are pressure, blows, &c. on the region of the stomach, cold, the striking in of acute or chronic eruptions, vexation and passion on the part of the wetnurse, coupled with a sort of *constitutio annua*. Although this disease, owing to the nature of the organs affected, and the want of tone and resistance in the fibres of children, admits only of a still more unfavorable *prognosis* than in similar cases of adults, it is nevertheless curable under favorable circumstances. The treatment requires first of all a removal of the inflammation by the application of leeches round the stomach (from 2 to 6), fomentations, with an addition of the leaves of *hyoscyamus* or *conium*, and gentle rubbing in of *ungt. ciner.* and *ol. hyosc. coct.* and opening and tranquillizing clysters. Medicines to be taken internally are to be avoided as much as possible, for they generally do more harm than good. They must be given in small portions, and must belong to the class of demulcent and slimy remedies. Salts, even calomel, must be avoided, while the inflammation is at its height. If these measures subdue the inflammation, we must ascertain by careful observation, the path to recovery which nature has opened to us. If cold has caused the disease, it is generally decided by a critical sweating, assisted by a modification of diet, a weak infusion of lime blossom, at the most by some *liquor. ammon. acet.* If gastric disturbances are at the bottom of the mischief then (of course after a complete removal of the inflammation,) we may employ *sal ammoniac* in a *decoct. althææ.* There is no need of any special subsequent treatment. We must, however, particularly avoid *tonics.* 2. If the disease does not terminate then in a complete cure, and if death does not ensue in the first 24 hours, a condition supervenes which has hitherto been regarded as a distinct disease—as gastromalacia. The child cannot digest anything, throws up everything it takes, and a little afterwards vomits without having taken anything; the matter it throws up is sour and fetid; and it always expresses a sense of pain when its distended stomach is touched. Soon after we have colliquative diarrhœa with the other manifestations of hectic disorder, and after long suffering the scene is suddenly closed by death, often without any warning. The prognosis is naturally unfavorable; and, hitherto, the treatment has not had much success to boast of. The only

hope rests on the application of outward means and on a suitable diet. Food, whether liquid or solid, must be given to the child only in small portions, and at fixed intervals. Give it whey, new milk from the cow, or pure water, with light broth, a small quantity of yelk of egg and arrow-root, and bathe it in bran with or without milk, but only lukewarm. If amelioration takes place, lessen gradually, and with the greatest care, the temperature of the bath. If the cooler baths also agree with the child, the prospect of recovery is near at hand. If costiveness occurs use mild clysters; certainly not any remedies which increase the irritability of the stomach. If these methods check the further progress of the disorder, the child should persevere in the use of the cool bath, or be washed daily in cold water; the malt-bath is also especially deserving of commendation, because it strengthens without stimulating. Exercise in the open air must not be neglected. The region of the stomach may be covered with an aromatic plaster. As a remedy to be taken inwardly we may use a decoction of acorns (*Eichelkaffee*), and if it agrees, *Ferr. carbon*, or *Tinct. ferr. muriat.*

But even when there is no chance of recovery, some of the most painful symptoms require at least palliative remedies, such as the burning thirst and the constant vomiting. The best way to subdue both of them is to swallow small bits of ice. The accompanying slow fever must be moderated as far as may be with constant regard to the organ which suffers. The only drink and nutriment under these melancholy circumstances should be fresh milk from the cow, the goat, or the ass.

Art. 123.—*On the Employment of Stimulants in the Treatment of Pulmonary Inflammation in Children.*

(Journal für Kinder Krankheiten.)

[We recommend the observations contained in the annexed Paper to the diligent attention of our readers]:—

Although in the inflammatory diseases of adults, great success is obtained by the use of antiphlogistic remedies, the same diseases in infants require considerable modification in treatment. The energy of the circulation in the infant is less developed than in the adult; wherefore it is more readily depressed by evacuants, and less prone to allow of resolution under their use.

This peculiarity is especially to be observed in the pulmonary inflammations, in which the symptoms of excitement are transient, and after bleeding speedily give place to symptoms of asthenia which increase if the antiphlogistic regimen be persisted in.

In the majority of cases, adynamic symptoms occur in the bronchitis and pneumonia of infants, soon after the first bloodletting, and may be thus recognized:—The infant becomes pale, their lips livid, and the face almost hippocratic, the pulse becomes almost uncountable, and the respiratory movements are correspondingly frequent. The cough, on the contrary, diminishes in frequency. If the bloodletting have been repeated, symptoms of cerebral exhaustion are superadded.

Dangerous, however, as these symptoms may be, the prognosis is not altogether unfavorable, if the antiphlogistic regimen be omitted, and stimulants be had recourse to. Wine in such cases, given in small quantities, quickly improves the character of the pneumonia, diminishes the frequency of the pulse, and procures refreshing sleep.

In a general way this change in treatment is indicated, when after the appearance of bronchitis, bloodletting, calomel, and tartar emetic have been employed for two days, without any appreciable amendment.

We must not wait for the appearance of adynamic symptoms before we have recourse to the stimulant plan of treatment; we must endeavour to prevent them. For this purpose less energetic stimulants, as the polygala senega and ammonia, will suffice. If the above-mentioned symptoms show themselves, we must not hesitate to administer wine and to continue its use until sleep be induced.

ART. 126.—*On the therapeutic Value of Alum in Whooping-Cough.* By Dr. GOLDING BIRD.

(*Guy's Hospital Reports*, April 1845, p. 134.)

In reference to this subject Dr. Bird thus remarks :—

" During the last three years I have extensively prescribed this drug in cases of whooping-cough. Like all other remedies which have been considered specific, its administration will end in disappointment, unless discrimination be used in selecting the proper stage for its exhibition; but with this precaution I have no hesitation in expressing an opinion, from the experience I have now had of its therapeutic value in whooping-cough, that in one stage of the disease alum will be found a most valuable remedy.

" It is unnecessary to allude to the distinct stages observed in every case of pertussis, further than to remark, that it is important to distinguish between the first, acutely inflammatory or catarrhal, and the second, or nervous, in which the spasmodic cough, with a more or less copious bronchial flux, exists. In the first stage, the use of any reputed specific would of course be avoided by every reputed practitioner, the safest treatment being that of ordinary bronchitis. But after the persistence of the disease for a week or two, and all inflammatory symptoms have subsided, and when with a cool skin and clean tongue the little patient is harassed by a copious secretion from the bronchi, the attempt to get rid of which produces the exhausting and characteristic cough, alum will be found to be of much value. I have not yet met with any other remedy which has acted so satisfactorily, or afforded such marked and rapid relief; the dose has generally ranged from 2 to 6 grains. For a child of two or three years the following formula has usually been employed :—

Aluminis, grs. xxv; Ext. conii, grs. xij; Syrup. rhæados, ʒij; Aquæ anethi, ℥iij. M. ft. Capiat coch. j med. 6 quâque horâ.

[Dr. Bird further states that no ill effects are perceived upon the bowels from the astringent qualities of the medicine. He does not explain the modus operandi, but thinks that it acts by allaying spasm and restraining inordinate bronchial secretion. He has used alum with equal benefit in the bronchorrhœa of emphysema.]

ART. 127.—*Efficacy of Liquor Ammonia in Pertussis.* Dr. Peyroton recommends the following prescription in whooping cough :—

℞ Aq. destil. lactucæ vir. ℥iv.
——— flor. aurant. ʒij.
Syrup. pæoniæ officin. ʒj.
——— belladonnæ ʒij.
Ammon. liquor. qts. vj.

Misce, ft. Mist. coch. magn. unum 4tis horis sumendum.

Four cases are quoted as proofs of its efficacy; the cure in all was rapid and complete.

Revue Médicale. Med. Times, Jan. 18, 1845.

PART IV.—STATISTICS.

ART. 126.—*Statistics of Sickness in different Classes of Society.* [The accompanying statistical information respecting the average duration of sickness in different classes, will be read with interest by those members of the profession who already contract, or are thinking of contracting, for the attendance of members of benefit societies. For some sensible remarks in connexion with the tables, we refer our readers to a leading article in the *Lancet* of March 22, 1845.]

The duration of sickness among labourers and operatives in various parts of the kingdom, is as follows:—

Age.	Labourers in East India Company's Warehouses.	Operatives in the Lancashire Cotton Factories.	Inhabitants of the Wynds, Edinburgh.
	DAYS.	DAYS.	DAYS.
16 to 21	4·02	4·42	2·13
21 .. 26	5·40	4·91	5·1
26 .. 31	4·49	6·88	11·0
31 .. 36	4·55	3·85	8·3
36 .. 41	5·57	4·13	4·1
41 .. 46	5·18	5·09	15·1
46 .. 51	5·43	7·18	30·0
51 .. 56	6·80	3·47	16·2
56 .. 61	7·21	12·68	30·4
61 .. 66	10·24	....	42·7
66 .. 71	9·93	....	64·2
71 .. 76	10·60	....	41·0
76 .. 81	12·67	....	83·6

Age.	Average Annual Sickness in Scotch Benefit Clubs.	Average Annual Sickness in Provident Classes throughout Great Britain.
	DAYS.	DAYS.
18	2·5	5·18
23	3·8	6·75
28	4·6	6·78
33	5·6	6·33
38	6·2	7·86
43	8·8	9·02
48	9·1	11·76
53	14·8	16·77
58	17·8	23·57
63	20·0	33·22
68	36·0	61·22
73	38·6	101·44
78	70·9	164·72

Art. 127.—Dr. Orr's *Statistical Tables of the Glasgow Infirmary.* Of 93 deaths by typhus fever, there occurred—

	MALES.	FEMALES.	TOTAL.
On the 8th day of the fever..	1	1	2
.. 9th	5	2	7
.. 10th	4	2	6
.. 11th	2	4	6
.. 12th	6	2	8
.. 13th	2	4	6
.. 14th	1	1	2
.. 15th	2	5	7
.. 16th	7	1	8
.. 17th	2	1	3
.. 18th	3	1	4
.. 19th	1	0	1
.. 20th	3	3	6
.. 21st	0	1	1
.. 22d	0	3	3
.. 23d	0	2	2
.. 24th	1	1	2
.. 25th	0	2	2
.. 26th	1	2	3
.. 27th	1	0	1
.. 45th	1	0	1
.. 46th	1	0	1
.. 48th	1	0	1
Date unknown.....	10	0	10
	55	38	93

Edinburgh Medical and Surgical Journal, April 1845.

Art. 128.—*Statistics of Poisoning in the New York States.* Of 83 cases of poisoning, there were—with laudanum, 39; arsenic, 13; opium, 8; tincture of sanguinaria, 4; morphine, 3; corrosive sublimate, 3; sulphuric acid, 2; paregoric elixir, 1; tartar emetic, 1; alcohol, 1; brandy and laudanum, 1; strychnine, 1; prussic acid, 1; phosphorus, 1; carbonate of potash, 1;—total, 83. Of this number, 48 were criminal cases, 22 the result of error or ignorance, 2 of suicide, and 2 from unknown motives.

The smallest dose of arsenic taken was four grains; the largest, eight. The shortest time in which death took place after this poison was four hours; the longest, two days.

Journal de Pharmacie et de Chimie.

Art. 129.—*Statistics of Suicide in France.* The number of suicides in 1843 amounted to 3020; which surpassed that of 1842 by 154; of 1841, by 206; of 1840, by 263; so that there has been a regular increase during the last three years. The distribution of suicides in the different departments is as follows:

Seine	551
—— et Oise	113
—— Inférieure	112
Marne	101
Nord	89
L'Aisne	78
Seine et Marne	75
Somme	71
L'Hérault	13
Haute Garonne	12
Le Gand	23
La Gironde	26
L'Isère	30
Rhône	44

Of these there were of females 729, or 24 in the 100. We remark, also, 15 of children under 16 years of age; 20 octogenarians; 170 septagenarians; and 384 sexagenarians. The months most prolific in self-destruction were May, June, and July. The most common mode of death was drowning: 1098 adopted this; 954 hanged or strangled themselves; 450 used fire-arms; and 206 destroyed themselves with the fumes of charcoal. Of these latter, 151 were of the department of the Seine, in which Paris is situated.

The motives were mostly disappointed love, jealousy, the consequences of debauchery, reverse of fortune, domestic sorrrow, and physical suffering. One quarter of them were not of sound mind at the time.

Revue Médicale, Avril 1845.

Art. 130.—*Statistics of the Cæsarian Operation.* The editor of the *Jour. de Chirurgie*, after some remarks on the operation performed successfully by M. Lebeu (v. *Med. Times*, vol. xi, p. 277,) gives an abstract of a Memoir published at Copenhagen by Keyser, entitled *De Eventu Sectonis Cæsareæ.* Michaelis is the first author who published the results of this operation; he excluded as apochryphal all the facts anterior to 1750, and brought his researches down to 1833. A Danish physician continued it to 1839. These are the two statistical tables that Keyser submitted to a severe examination; he struck out 62 cases from Michaelis' list, and added 69 which the German author had rejected, or did not know of. He likewise enriched Levy's table with facts unknown to him. The number of cases in Michaelis' table was 265, and in Levy's 73—total 338; on which there were 128 successful, and 210 unsuccessful, operations. The mortality was—for children 0·32, for the parents 0·62. But, on account of the unsuccessful cases not having been published, it is positive that the mortality is greater; Keyser, therefore chose the cases which had occurred under his own eyes; and on 67 cases he reckoned 52 fatal, or 0·79. Wilde stated that the mortality was about 0·90; and Levy coincides with this opinion. Considering the mortality in children according as the mother died or survived, Keyser found it to be 0·32 in the former, and 0·27 in the latter. According to the time which had elapsed from the commencement of the labour until the moment of the performance of the operation, Keyser has formed three categories: in the first it was done during the first 24 hours; in the second, from 25 to 72 hours after; and in the third, after

72 hours had elapsed. In the first the mortality was forthe mothers 0·67, and for the children 0·28; in the second, mothers 0·55, children 0·32; and in the third, mothers 0·72, and children 0·60. In 112 cases in which the condition of the membranes were observed, there were 47 successful and 65 unsuccessful; of the former, in 12 the membranes were entire, and the average time which had elapsed in the others ere the operation was performed was 18 hours; of the latter the membranes were entire in 7 cases, and the average time in the remainder was 26 hours. Dividing these last into three categories, we find when the operation was performed immediately, or at farthest in six hours after the rupture of the membranes, that the mortality was for the parent 0·50, for the children 0·14; when from 7 to 24 hours had elapsed, mothers 0·60, children 0·22; beyond 24 hours, 0·66, and 0·49. In 32 cases in which version, the application of the forceps, or perforation of the cranium, had been previously attempted, the mortality was 0·66; and in 28 of these 32 cases, the mortality of the children was 0·82; it was 0·60 when the diminution of the pelvis was owing to rachitism, and 0·69 when produced by mollites ossium. In 147 cases the incision was made in the linea alba; mortality, 0·56: on the side in 56; mortality 0·68. In cases of hemorrhage, mortality 0·72; of hernia, 0·67. The mortality when the measurement of the pelvis was $1\frac{1}{2}$ inch, and less, was 0·47; on the contrary, when it was $1\frac{3}{4}$ and above, it was 0·66. On 123 cases, the causes of death were as follows:—

77 died from inflammation of the abdomen.
29 „ „ nervous accidents.
10 „ „ effusion of blood.
2 „ „ internal hemorrhage.
2 „ „ inflammation of the thoraic organs.
1 „ „ rupture of the uterus, and violent hemorrhage on the 7th day.

Relative to the epoch of death, it took place: once immediately; 9 times in less than 6 hours; 16 times in from 6 to 24 hours; 108 times from the 1st to the 7th day; 16 times from the 8th to the 21st day: once on the 30th day by osteomalacia; and once on the 36th day by intestinal perforation.

Medical Times, Feb. 22, 1845.

Art. 131.—*Statistics of Hernia.* M. Maisonneuve has made a statistical report of 11,644 cases of hernia, which were examined during a period of six years, at the Central Bureau, Paris. He thus distributes them:—

Of 11,644 cases of abdominal hernia of every description,
8790 were observed in males.
2854 were observed in females.

Of 8790 cases of hernia observed in males,
8237 were inguinal hernia.
307 were crural hernia.
246 were umbilical hernia.

Of 2854 cases observed in females,
1112 were inguinal hernia.
639 were crural hernia.
560 were umbilical hernia.
543 were vaginal hernia.

Of 8237 cases of inguinal hernia observed in males,
4483 occurred on the right side.
3738 occurred on the left side.
16 not determined.

Of 1112 cases of inguinal hernia in females,
542 occurred on the right side.
564 occurred on the left side.
6 not determined.

Of 307 cases of crural hernia observed in males,
171 occurred on the right side.
125 occurred on the left side.
11 not determined.

Of 639 cases of crural hernia observed in females,
344 occurred on the right side.
255 occurred on the left side.
40 not determined.

From these figures Mons. Maisonneuve deduces the following corollaries:—

First. Herniæ in males are to herniæ in females as to 3 to 1.

Secondly. In 100 herniæ found in males,
93 were inguinal.
4 were crural.
3 were umbilical.
Whilst in 100 of hernia found in females, the proportion was,
40 inguinal.
21 crural.
20 umbilical.
19 vaginal.

Thirdly. In men inguinal herniæ are met with as often on both sides as on one only, and in the latter case those of the right side are to those of the left in the proportion of 5 to 4.

But in women inguinal herniæ are met with on both sides three times out of the four, and those of the right side are to those of the left in the proportion of 5·42 to 5·64.

Fourthly. In men, crural hernia is met with on one side only, three times out of four, and those of the right side are to those of the left as 7 to 5; whilst in women, crural hernia is met with on one side only four times out of five; and those of the right side are to those of the left as 7 to 5.

Under the head vaginal hernia are included all tumours of the vagina and uterus presenting externally, and requiring the use of the pessary, as cystoceles, rectoceles and prolapsus of the vagina and uterus.

Under the head umbilical hernia are included hernia of the linea alba, and displacement referrible to the neghbouring regions.

Gazette des Hôpitaux, and *Medical Times*, Feb. 22, 1845.

ART. 132.—*Duration of Life in the Peerage and Baronetage, as compared with the Inhabitants of certain large Towns and Country Districts.*

Age.	Peerage and Baronetage.	England.	Surrey.	Metropolis.	Liverpool.	Age.	Peerage and Baronetage.	England.	Surrey.	Metropolis.	Liverpool.
20	38	40	42	36	33	65	10	11	11	..	..
25	35	36	38	32	30	70	8	8	8	..	..
30	31	33	34	29	27	75	6	6	..	..	..
35	27	30	31	25	23	80	5	5	..	..	..
40	24	27	27	22	21	85	4	4	..	..	..
45	21	23	24	19	18	90	3	3	..	..	..
50	18	20	21	16	15	95	2	2	..	..	..
55	15	17	17	14	..	100	1	..	..	..	..
60	13	14	14	..	..						

Age.	Peerage and Baronetage.	England (Mr. Farr.)	English Annuitants (Finlaison)	Sweden and Finland (Milne.)	Carlisle (Milne.)	Equitable (Morgan.)	Amicable (Galloway.)	French Annuitants (Deparcieux.)
20	38	40	38	39	41	42	..	40
25	35	36	36	35	38	38	38	37
30	31	33	33	32	34	34	34	34
35	27	30	30	28	31	31	30	31
40	24	27	27	25	28	27	26	27
45	21	23	24	21	24	24	22	24
50	18	20	20	18	21	20	19	20
55	15	17	17	15	18	17	16	17
60	13	14	14	12	14	14	13	14
65	10	11	12	10	12	11	10	11
70	8	8	9	7	9	9	8	9
75	6	6	7	5	7	7	6	6
80	5	5	5	4	5	5	5	5
85	4	4	3	3	4	3	4	3
90	3	3	2	3	3	3	3	2
95	2	2	..	2	3	..	..	..
100	1	..	..	..	..	..	..	..

A comparison of the columns of these two tables is less favorable than might have been anticipated to the higher classes, the expectation of life among the families of the peerage and baronetage being during the greater part of life less than in the whole of England, in the county of Surrey, in Sweden and Finland, among the persons (chiefly males) insured in the Equitable and Amicable, and among the French and English annuitants. On the other hand, the expectation of life is greater than among the inhabitants of the metropolis and Liverpool.

In searching for an explanation of this somewhat unexpected result, two alternatives offer themselves; either the deaths recorded in the peerage and baronetage include those of an undue proportion of young persons, by which the expectation of life is made to appear less than it really is, or the sanitary condition of the entire class is less favorable than the many advantages they possess over the greater part of the community would lead us to expect. The former alternative does not appear very probable, as there is no obvious reason for the disparity just mentioned. All males who attained the age of 21 or upwards, have been included in the tables, without any other exception than those who perished by violence or accident. As death from these causes generally occurs comparatively early in life, these exceptions would tend to make the expectation of life appear somewhat more favorable. The latter alternative, therefore, namely, that the sanitary condition of the privileged classes is less favorable than that of the several classes included in the table, seems the more probable one.—[Dr. Guy on Duration of Life in the Peerage and Baronetage, *Statistical Journal*, March 1845.]

REPORTS

ON THE

PROGRESS OF THE MEDICAL SCIENCES.

January—June 1845.

The intention of the following Reports is to pass in review the principal additions to each department of Medical Science, which have been placed on record during the preceding six months. It is not contemplated that they should be confined exclusively to the notice of what is new; any fact or doctrine which may be considered practically useful, will, although not strictly novel, be regarded as worthy of commemoration. It must be obvious to all who are aware of the immense mass of information which is almost daily put forth by the medical press of this and other countries, that the notice of every subject would be an impossibility. It therefore devolves upon the writers of each Report, to select only such articles for retrospection as may possess superior recommendations, either of an intrinsic character, or in relation to the main end and aim of all medical knowledge—the alleviation of suffering and disease.

I.

REPORT ON THE PROGRESS OF PRACTICAL MEDICINE, PATHOLOGY, AND THERAPEUTICS.

BY THE EDITOR.

[The figures in parentheses refer to corresponding Articles in the Abstract.]

It is probable that any nosological arrangement which might have been selected in the following Report, would have been open to some objection, as it is impossible in the existing state of knowledge to classify diseases in such a manner as to obviate imperfection. The writer has considered that under these circumstances he should lay himself less open to criticism by adopting that arrangement which has been suggested by Mr. Farr, than by attempting to devise any original method.

§ I.—*Zymotic Diseases.*

1. *Continued Fever.* The period which our present Report professes to embrace has not been remarkable either for the number or importance of the communications upon the subject of fever. We may, however, observe that Dr. Davidson has presented us with a series of aphorisms on the treatment of typhus which cannot fail to recommend themselves to notice by their simplicity, and perfect accordance with those enlightened views of the pathology of the disease which are prevalent in the present day. These observations will be found among our abstracts, and therefore need not be further insisted upon. (2) On the same subject we may refer to memoirs by M. Sandrat, and M. Delaroque*, in each of which the treatment is discussed at considerable length. The former relies entirely upon the repeated exhibition of Seidlitz water; M. Delaroque endeavours to point out the beneficial effects of more energetic purging. This latter memoir, in other respects, contains nothing which is either new or interesting to the British practitioner, and appears in fact to be a mere repetition of the principal points in a work published by the author in 1839, and of which as much notice as it deserves will be found in the *British and Foreign Medical Review*, Oct. 1844.

In a discussion upon the pathology of typhoid fever, in which the Académie Royale de Médecine Belgique has lately been engaged, much difference of opinion existed upon the principal propositions contained in a paper read by M. Mascart.† The author, in acknowledging the origin of fever from miasmatic intoxication, endeavours to show :—1st, That the effect of the poison is to diminish the quantity of fibrin in the blood; 2dly, That the blood thus diseased excites an inflammation of the lining

* Revue Médicale, Jan. 1845.

† Bulletin de Méd. Belge. No. 3.

membrane of the blood-vessels, which inflammation is to be considered as the natural means of restoring the deficiency of fibrin, according to the laws established by Andral and Gavarret; and 3dly, That the ulceration of the intestinal follicles is likewise a natural process by which the morbid poison is eliminated, and consequenly that it should not be interfered with. These opinions were combated seriatim by several of the members present, and by M. Fallot in particular, who clearly exhibited their untenability. The first proposition, as he observes, is negatived by the researches of Andral and Gavarret, who distinctly state that the blood undergoes little or no alteration in typhus until the latter stages of the disease. It is also, we may remark, opposed by the more recent investigations of MM. Becquerel and Rodier,* which tend to the belief that the fibrin is not diminished in typhoid fever at all, excepting in its most adynamic type, or when bloodletting has formed a part of the treatment. The second proposition is met by the serious objection that if diminution of fibrin does in reality excite vascular inflammation, that phenomenon ought to occur in all cases in which this constituent of the blood is notably deficient. Such, however, is not observed to be the fact either in scurvy, or in the cases in which the blood has been artificially defibrinized, as in the experiments of Magendie. The third proposition, namely, that the inflammation and ulceration of the intestines is a salutary process, is scarcely worthy of formal refutation, the smallest experience being sufficient to show that this lesion forms in all cases in which it is present the most serious obstacle to recovery, and that the diarrhea which it produces is of all the symptoms the one most difficult to subdue.

2. *Remittent Fever* has been treated of by Dr. Swett† in a clearly written essay, the principal object of which is to confirm the opinion previously advanced by Dr. Steward, that the most characteristic lesion in the severe remittents of warm climates is a peculiar condition of the liver, which consists in a blueish gray or slate colour of the parenchyma, with the interspersion here and there of patches of a bronzy tint. The granular structure is at the same time quite distinct, each granule being surrounded by a ring of vascular injection.

3. *Scarlatina.* Under this head we have to mention a paper by Dr. Alison,‡ calling the attention of the profession to the not uncommon occurrence of pericarditis as a complication of the cutaneous affection. The author cites the names of those writers who do, as well as of those who do not, allude to this subject, and it appears that the latter are greatly in the majority. From this fact alone we should be disposed to think that the frequency of the complication has been somewhat exaggerated. That the pericardium, however, is liable to inflammation in the course of scarlet fever may be seen in the writings of Drs. Joy‖ and Burrows as mentioned by the author, in those of Dr. Golding Bird,§ and likewise in the *Stuttgard Collection of Children's Diseases,*¶ where the occurrence of purulent collections in the pericardium during scarlet fever is alluded to by Von Ammon. There does not appear to be any peculiarity in the type of the fever in which this complication exists, neither does it require any special modification in the treatment which is best adapted to the idiopathic disease, it is necessary merely to bear in mind, that as it supervenes upon an affection which depends upon the imbibition of an animal poison, great circumspection is necessary in the employment of depletory measures. (3)

* Gazette Médicale de Paris, 48, 49.
† American Journal of Med. Sciences, Jan. 1845.
‡ Medical Gazette, Feb. 1845, p. 664.
‖ Encyclopæd. Pract. Med., art. Scarlatina.
§ Guy's Hospital Reports, April 1845.
¶ Brit. and For. Rev. July 1842, p. 205.

Dr. Wilshire combats the opinion that the dropsy which follows scarlet fever is in general an inflammatory disease, and maintains, on the contrary, that it is rather one of an asthenic character. In this view of the case we entirely concur, believing it to be especially true as regards the children of the poor, who from circumstances, the operation of which is sufficiently evident, are particularly exposed to the sequelæ of eruptive diseases. Dr. Wilshire speaks highly of the iodide of potassium in a bitter infusion, as a remedy in these cases. (4)

Dr. Golding Bird, who took part in the discussion which was elicited by the enunciation of the foregoing opinion, speaks of two forms of scarlatinous dropsy, one simple and manageable, the other highly dangerous, inasmuch as the blood contains some of the uneliminated elements of the urine. In another place* he endeavours to explain the more frequent supervention of the dropsical symptoms upon the slight than the severe forms of the eruption, somewhat after the following manner. He supposes it to be conceded that the disease originates in a poison, the primary location of which is in the blood. The two principal features of the disease, namely the eruption on the skin, and the erythismic excitement of the mucous surfaces, are the means which nature makes subservient to the elimination of this poison. If therefore the rash be well developed, the system is effectually disembarrassed of the morbific agent; but if not, the poison not being all excreted, some of its recognised after-effects result. How, he inquires, are these effects induced? Granting the existence of the imperfectly exhausted materies morbi in the blood, attempts will be made after the subsidence of the eruption, to eliminate this matter by one or other of the emunctories of the body. The kidneys are the organs by which matters in solution in the blood are usually excreted; and either from deficient determination to the skin in the first instance, or from the application of cold subsequently, are made to assume a supplementary duty; their capillaries therefrom become dilated, and congestion ensues. The consequence of this is a double lesion of their function; on the one hand, exudation of the albuminous element of the blood, and on the other retention of the nitrogenized products. Contemporaneously with this, serous effusion generally, but not invariably occurs.

Dr. Corrigan† describes a peculiar and very fatal form of scarlatina anginosa, which he states has not been noticed by any preceding writer. In this, however, he is in error, as the same form is clearly alluded to by Dr. Watson (Lectures, vol. ii. p. 758) who, it may be observed, also acknowledges its great severity. This variety of the disease consists in the rapid swelling of the parts beneath the angle of the jaw, without any corresponding inflammation of the throat internally. The swelling occasionally arrives at an enormous size, and the child usually sinks under the sloughing of the cellular tissue, or from the effects of pressure upon the cervical blood-vessels. Dr. Corrigan especially warns the surgeon against opening the tumour, or making incisions through the integuments, which he might otherwise be tempted to do, under the impression that he had met with a case of diffused cellular suppuration. He has never seen the slightest benefit from such a proceeding, and when it has been practised the cellular tissue, instead of containing pus, has been found to be infiltrated with dirty-looking serous fluid. The only treatment which can be relied upon is that

* Guy's Hospital Reports, April 1845.

† Medical Times, May 10th, 1845. Clinical Lectures by Dr. Corrigan.

of the preventive kind, and which consists in the application of relays of a small number of leeches; but this must be instituted before the inflammation is fairly established, or the patient will, according to Dr. Corrigan, be inevitably lost. The same affection is apparently referred to by M. Rostan as forming a serious complication in typhoid fever. (1)

In connexion with the subject of scarlatinal dropsy, Dr. Golding Bird details a simple method of detecting urea in the blood and serous fluids. The blood having been allowed to coagulate, the serum is to be decanted, and shaken up with an equal quantity of rectified spirit, which causes the precipitation of albumen. The mixture is then to be filtered, and the filtered fluid, after having been evaporated to two drachms, is to be treated with an equal bulk of dilute nitric acid, and again filtered. The filtered fluid being slowly evaporated on a watch-glass, will exhibit the feathery crystals of nitrate of urea. The treatment recommended by Dr. Bird in this form of dropsy is simple, and, according to our experience, generally successful. It consists in the endeavour to promote active diaphoresis by the use of the warm-bath and small doses of the Vin. ant. potass. tart. in julep. ammonia.

4. *Glanders.* The possibility of the transmission of this fatal disease from animals to man, though long doubted, and even by some disbelieved at the present time, is nevertheless a fact, which may be considered as incontrovertibly established. The case reported by M. Pavard (5) is a faithful portrait. To those of our readers who are anxious to be acquainted with all that is known upon the subject, we would suggest the perusal of a paper by M. Rayer, published in 1837, of which an excellent notice will be found in the *British and Foreign Medical Review*, January 1842.

§ II.—*Diseases of the Nervous System.*

5. *Insanity.* The melancholy subject of mental derangement receives increasing attention. Among the most important additions to our knowledge in this department, which the last six months have produced, we may refer to the Reports of Dr. Conolly* on the Lunatic Asylums of Paris and other French towns, and to that of the Commissioners upon the condition of Lunatic Asylums in England and Wales. The latter affords a sad picture of the abodes of pauper lunatics in particular in this country, but in some degree also inculpates those intended for the reception of the wealthier classes. There is one practical fact elicited by the inquiries of the commissioners which, although not new, is yet worthy of repeated mention; it is that of the large proportion of cures among patients admitted within three months of their first aberration, as compared with those who have been kept at home, or in the workhouse for longer periods.

In a series of lectures now in the course of publication by M. Baillarger,† the hereditary nature of insanity is strongly insisted upon. According to the observations of M. Baillarger, the transmission of the malady is to be apprehended under any of the following circumstances:—When the father or mother is insane at the time of or previously to conception;—when the father or mother have insane blood relations;—when they are remarkable for eccentricity or violence of character;—when they have suffered from diseases of the nervous system;—if either have committed suicide, or has been addicted to drinking, or is old relatively to the other.

* British and Foreign Medical Review, April 1845. † Lancet, Jan. 1845, et seq.

Mr. Grantham* and Dr. Winslow† remind us of the great importance of paying attention to the premonitory signs of mental derangement, for it is at this time that the patient stands as it were upon neutral ground, and that the question of his restoration is often to be decided. The symptoms indicative of the approach of mania which are clearly described by the latter writer, are, he thinks, in most cases to be referred to bodily derangement, and do not depend as is thought by some upon purely pschycological disturbance.

Some useful remarks upon that form of insanity which is occasionally seen to follow the exhaustion induced by prolonged suckling, are to be found in Dr. Ashwell's late work. The treatment therein recommended is such as would be instituted by any well informed practitioner, and embraces weaning the child as a sine qua non, together with the persevering use of tonics combined with sedatives, pure air, and exercise proportioned to the strength. (119)

6. *Apoplexy.* The pathological conditions of the cerebral portion of the nervous system, have always been held to be the most difficult to be comprehended of any to which the human frame is amenable. There is a want of correspondence between lesions and symptoms, a want of uniformity in the manifestations of diseased action, which renders the subject one of surpassing intricacy. Not the least remarkable property connected with cerebral diseases, is the fact which is frequently manifested in the malady under consideration, that precisely the same train of symptoms may be produced by causes diametrically opposite; as for example, by too much blood circulating in the vessels of the brain, and too little,—by a state of plethora as well as by that of anemia. This being the case, it becomes a question of the most vital consequence in practice to determine, to which of these conditions a given apoplectic seizure is to be attributed. This question is not so ready of solution as might at first sight be supposed. The tendency of medical men in general is too much to regard all apoplectic attacks as the result of fulness, whence bleeding is as much too frequently adopted. But that such a mode of viewing the phenomena of the disease as a general rule is as erroneous as the treatment arising out of it is dangerous or even fatal, will, we are convinced, become daily more universally admitted. The small amount of influence which the practice of bloodletting exercises in the cure of apoplexy is sought to be established in a late publication by Mr. Copeman,‡ upon the evidence of statistical data. Although we cannot admit that all the cases upon which the deductions of this author are based, are the best which might have been selected, they are still, we think, sufficiently trustworthy to be recorded as an approximation to the truth. It appears that of 155 cases of apoplexy in which the treatment is specified, 129 were bled, and only 26 were not; of the former number, 51 recovered, and 78 died: the cures, therefore, were as 1 : $1\frac{1}{2}$; the deaths, as 1 : $1\frac{2}{3}$. Of the number not bled, 18 were cured, and 8 died, the proportion of cures being as 1 : $1\frac{1}{2}$; of deaths, as 1 : $3\frac{1}{4}$. Abstracting a certain number of these cases in which the bleeding consisted in the application of a few leeches only, we reduce the figures to 112; of those 38 recovered, and 74 died, i. e., there were two deaths where bleeding was practised to one cure. Although, as has before been said, these facts are to a certain degree imperfect, and like all deductions connected with so inexact a science

* Facts and Observations on Medicine and Surgery, 8vo. 1845.

† Paper read before the Medical Society of London, reported in Lancet, March 1, 1845.

‡ On Apoplexy. London, 8vo. 1845.

as that of medicine, which are based upon the numerical method, are open to objection, they must, nevertheless, have the tendency as far as they go to place the abstraction of blood as a general remedy in apoplexy in an unfavorable light.

It is still however unquestionable, that in a certain number of cases of apoplexy, free bloodletting is imperatively called for. How then are these cases to be distinguished? The author above-mentioned places great confidence in the appearances of distension of the external vessels of the head; but this rule will in many cases be fallacious, in those patients in particular in whom constant exposure to the vicissitudes of temperature and season has produced a dilated condition of the capillary vessels of the face. In these persons a florid countenance is perfectly compatible with a state of system intolerant of the loss of blood, and would therefore, if relied upon, lead to serious errors in practice.

A surer guide in a doubtful case will be found in some observations by Dr. Marshall Hall,* which we have considered of sufficient value to merit a place in our Abstract (7), and to which the reader is therefore referred. We shall merely remark, that the plan of diagnostic bloodletting, as recommended by Dr. Hall, is even as yet scarcely appreciated, and that when judiciously carried out it will frequently be the means of avoiding error, not only in the case in question, but in the many pseudo-inflammatory diseases which the readiest tact occasionally fails otherwise to diagnosticate.

In connexion with the subject of apoplexy, we may mention a paper read a short time since before the Medico-Chirurgical Society by Mr. Hewett upon extravasations of blood within the cavity of the arachnoid. The author distributes these effusions into four principal groups; 1st. Those in which the blood is either liquid or coagulated, in the latter case being spread out in the form of a membranous layer; 2d. Those in which the extravasation presents itself in the shape of a false membrane; 3d. Those in which the blood is enveloped in a sac having every appearance of a newly formed serous membrane; and 4th. Those in which the blood is fluid and encysted. Of these the third division is important in a physiological sense, as it tends to confirm the opinion that the blood is capable of undergoing organization by an inherent action, quite independent of that of surrounding tissues. In other respects the observations of Mr. Hewett are for the most part in accordance with those of MM. Becquerel, Legendre, Prus,† and Rilliet and Barthez,‡ the latter of whom however notices meningeal apoplexy only as it occurs in infants and young children. We may remark, *en passant*, that the rare occurrence of true sanguineous apoplexy in an infant only eleven days old, has recently been observed by Dr. Campbell.§

7. *Ramollissement:*—The latest researches upon the subject of cerebral softenings are those contained in a memoir by M. Rochoux.‖ The opinions of this writer differ from those of many previous authors, as Lallemand, Cruveilhier, Carswell, and more especially Durand-Fardel, in the affirmation that the softening of the cerebral substance, which is so commonly seen in the neighbourhood of apoplectic clots, is the precursor and not the consequence of the hemorrhage. This form of softening to which he applies the term "hæmorrhagiparous," he believes to be present in 99 cases out of 100

* Practical Observations and Suggestions, &c. London, 8vo. 1845.

† Acad. de Med. Séance, d'Avril 4, 1844.

‡ See Dr. West's Report on the Progress of Midwifery, &c. Brit. and For. Med. Rev. April 1844.

§ Med. Gazette, May 23, 1845. ‖ Archives Générales de Médecine, Nov. 1844.

of sanguineous apoplexy. This is doubtless rigidly considered, too exclusive a view of the case, but we are nevertheless inclined to coincide with the author in so much as this,—that although sanguineous effusion may undoubtedly occur in the midst of perfectly healthy cerebral substance, that such an occurrence is exceptional rather than frequent; if it were not so, the proverbially uncertain tenure of life would be rendered still more uncertain, taking into account the many causes of vascular excitement to which the brain is continually subjected. The objection to this view which some pathologists, and Fardel among the number, have advanced, that if this precursory change in the cerebral pulp were so often present, it would more commonly make itself known by symptoms, is, as M. Rochoux justly observes, quite invalid, for how frequently do molecular changes go on unsuspected in organs, the investigation of which is far more easy than that of the brain?

M. Rochoux is likewise at issue with Durand-Fardel and others with respect to the pathological indications of the cavities filled with a yellowish coloured serum, which are frequently found in the brains of persons who have had an apoplectic seizure. He believes them in all cases to be the remains of apoplectic clots; M. Fardel, as may be remembered, considers that they are indicative of softening only, and not of hæmorrhagic effusion. The question, which is one of great interest, must be regarded yet as sub judice, for until we are able to appeal to a numerous series of carefully recorded cases of persons dying at progressively advanced periods after apoplectic seizure, no conclusions can be arrived at which can be received as worthy of confidence. M. Fardel has, we are aware, attempted this to a certain extent, but a more numerous selection of cases is required in order to give that value to his deductions which he is disposed to attribute to them. (8)

The dependence of white softening of the brain upon suspension of a portion of the cerebral circulation, has been long recognized as an occasional consequence of ligature of the carotid artery. In a case which has lately been reported by Dr. Todd,* the analogy of this lesion to senile gangrene is very distinctly shown. The patient was the subject of dissecting aneurism of the aorta, which had completely arrested the flow of blood through the right carotid artery. Soon after the original seizure, which partook of the nature of syncope, he became paralytic on the left side. After death the right centrum ovale exhibited a perfect specimen of white softening, the entire hemisphere being anæmic. The case is one of peculiar interest in other points of view, and will well repay the perusal.

8. *Cerebral Abscess.* The intimate connexion between abscess of the brain and affections generally of strumous origin, commencing in one of the structures of the internal ear, has been made the subject of a communication by Dr. Cormack,† which, however, need not detain us, as it contains nothing with which the profession has not long been familiar.

9. *Encephaloid Disease.* Dr. Cowan‡ has published two cases of this rare disease of the brain. As might be supposed, although there was ample evidence, in both instances, of organic mischief in the cerebral mass, nothing transpired to afford the slightest clue, at the time, to the real nature of the disease. Dr. Cowan, however, thinks, that as far as the evidence of these cases can assist the diagnosis, that malignant disease of the brain may be suspected when, in addition to distinct symptoms of organic change,

* Medico-Chirurgical Transactions, vol. xxvii.

† London and Edinburgh Monthly Journal, April 1845.

‡ Provincial Medical and Surgical Journal, April 16, 1845.

pains of a neuralgic character are present, and are accompanied by gradual emaciation and a cachectic appearance.

10. *Epilepsy.* The only observations worthy of record upon this subject, as involving anything of novelty, are those of M. Selade;* who has devised a method of treatment, founded upon the fact of the occasional suspension of the disease by the supervention of intermittent fever. His plan consists in the endeavour to establish an artificial intermittent, by the use of such means as bring about a state resembling the several stages of the genuine disease. Thus, in order to induce the factitious cold stage, the patient is submitted to a prolonged immersion in cold water. He is then placed in a heated room, and covered with bed-clothes, until the hot and sweating stages are counterfeited. Dr. S. states, as the result of his observations, that after the repetition of this process for a few times, at the same hour, the artificial intermittent establishes itself without the intervention of the bath; and details two cases in which obstinate epileptic attacks were thus completely and permanently removed. The subject of epilepsy has also been treated of, if in a less novel, certainly in a less fanciful manner, by M. Rodier,† who speaks highly of the scalp issue, and by Dr. Blackmore, whose remarks we have elsewhere given. (9 and 10.)

11. *Neuralgiæ.* Among the additions to our knowledge in this important class of diseases, we may refer to a monograph by M. Merat,‡ which treats principally of the painful affections of the ganglionic nerves. In the treatment of these, the author recommends the powder of valerian, and the Sedum acre, in large doses. The Cannabis Indica has likewise been suggested as a remedy for neuralgic diseases, by Mr. Donovan;‖ as also tobacco, by Mr. Chippendale§ (11); the expressed juice of the misletoe, by Mr. Hardy;¶ and electricity, by Professors Wisgrill and Wirey.** The extract of mistletoe is used in the form of a plaster, applied over the affected nerve. The pain is said in most cases to subside in a few minutes. In addition to these instances, we may mention that Mr. Rynd†† proposes the treatment of obstinate tic by the direct inoculation of the nerve with narcotic substances. He relates two cases, in which the acetate of morphia, in solution, introduced by means of puncture, was eminently successful. In reference to this suggestion, we may remark, that Mr. Rynd has been anticipated by M. Jaques, (*Annuaire de Therapeutique*, 1844,) who appears some time since to have adopted the identical process which he has recommended (10).

12. *Tetanus.* The periodical literature of the last few months holds out to us considerable encouragement in the treatment of this usually fatal disease, by the record of several cases, in which the means adopted have been followed by success. Of these Mr. Donovan‡‡ relates two, and Professor Miller one,§§ each of which yielded to the employment of the Cannabis Indica. The cases which occurred to the former writer place the powers of the medicine in a very favorable view; the first patient having recovered after taking 134 grs., although before its exhibition the spasms recurred every four or five minutes. According to Professor Miller there is a

* Gazette des Hôpitaux, Jan. 16, 1845.
† Gazette Médicale.
‡ Essai sur les Névroses des Nerfs Ganglionaires.
‖ Dublin Journal, Jan. 1845.
§ Lancet, March 1, 1845.
¶ Medical Times, April 19, 1845.
** Transactions of the Vienna Medical Association, British and Foreign Medical Review, April 1845.
†† Dublin Medical Press, March 12, 1845.
‡‡ Dublin Journal, January 1845.
§§ London and Edinburgh Monthly Journal, January 1845.

marked tolerance of this remedy in tetanic cases, and the unpleasant effects usually consequent upon its prolonged use are seldom observed.

Two cases have likewise been lately recorded in which material benefit, and in one case complete success, followed the use of ardent spirits in intoxicating doses. The first case is one related by Mr. Stapleton,* in which the tetanic spasms were entirely suspended, but the patient was not saved. The second occurs in a paper read before the Medico-Chirurgical Society by Dr. Wilson.† The patient, who was under the charge of Mr. Ilott, of Bromley, was obviously cured by the exhibition of brandy in enormous quantities, opium being at the same time studiously avoided. During the period of eight days, the patient took as much as two gallons of brandy, in addition to wine, &c. The discussion which followed the reading of this case chiefly turned upon the value of opium in tetanus, upon which the most opposite opinions appeared to be entertained. Among those, however, who supported the relater of the case in his opinion of the inutility of narcotics, were Dr. Wilson, Mr. Solly, and Mr. Curling. The subject of tetanus has also been treated of by Dr. Inglis‡ and Mr. Stafford.§ Amid the conflicting testimony which we meet with respecting the treatment of this fearful malady, it is difficult to arrive at any satisfactory decision as to the plan most likely to be successful. The fact, however, that the majority of tetanic patients appear to die by asthenia, affords strong evidence in favour of the propriety of the method adopted in the cases last related.

§ IV.—*Diseases of the Respiratory System.*

Upon this class of diseases we have to notice many interesting communications. Of those which relate to the diseases of the respiratory system in general, we call the attention of our readers with peculiar pleasure to a paper by Mr. Sibson,‖ which has for its object the determination of the topographical changes which the thoracic organs undergo in disease. The value of this laborious essay in the study of chest diseases cannot be too highly estimated; and whoever fails to make himself familiar with its contents, will be without excuse for those errors in diagnosis which it is so well calculated to obviate. We offer no apology for thus alluding to a work which, though recent, does not strictly come within the prescribed limits of our report, the fact that it is published in a form which precludes its general circulation, is, we conceive a sufficient reason for its mention.¶ It is not our intention to analyse this paper at the present time, as we shall have to refer to it on more than one occasion. We shall pass at once to the subject of

13. *Phthisis Pulmonalis.* The first work which we are called upon to notice under this head, is one recently published by Dr. Evans, in which doctrines widely different in many respects from those in common circulation are enunciated, but which will not, we imagine, be very generally received. According to the views of this author, that product, which we have always been taught to consider as of primary importance in the pathology of the disease, namely, tubercle, plays but a secondary part; being

* Lancet, March 22, 1845. † Meeting of April 22d, 1845.

‡ Provincial Medical Journal, February 19th, and March 26th, 1845.

§ Medical Gazette, April 29th, 1845.

‖ Transactions of Provincial Medical Association, vol. xii.

¶ Since the above was written we are happy to find that the essay alluded to has been published in a separate form.

no more, to use his own expression, the cause of the disease, than the pus is of pneumonia. Neither are the symptoms of phthisis allowed to depend upon the presence of this deposit; the emaciation, hectic, cough, &c. being all ascribed to pulmonary irritation, and active pulmonary congestion, combined with what he terms a "diminished force of growth." As may be surmised from these opinions, the author is a believer in the inflammatory origin of tubercle; that product being according to him, only a modification of pus, and secreted under certain states of constitution in the same manner. Pulmonary irritation is, with him, the most important condition to which the consumptive patient is exposed, that being in all cases the precursor and cause of the more serious and fatal symptoms. It is necessary, however, to state, what it is that the author designates by the term irritation. He observes that in a pathological point of view, irritation consists in the presence of a diminished quantity of blood in the affected tissues, which, in consequence, become dense, contracted, and pale, the natural secretions being at the same time suspended. This condition as it occurs in the lung he considers to be declared by an exaggerated respiratory murmur. We must here remark that, although we may not be disposed to object to the author's definition of irritation, if by that term he means to designate the same state of capillaries which, as in the experiments upon the web of the frog's foot, (James, *on the Nature of Inflammation,*) is brought about by a puncture or other means, and is the precursor of those vascular changes to which the term inflammation is applied, we must still doubt that such a condition ever precedes the deposition of tubercular matter, in the relation of cause. It is, moreover, we must confess, perfectly unintelligible to us how a state of lung in which the "tissues" are "dense," "contracted," and "pale," and in which, therefore, the air cells must be diminished in capacity can be evidenced by a sign which presupposes the admission of a preternatural quantity of air.

We shall pass over the author's opinions respecting the origin of tubercle, and briefly allude to his mode of treatment. This he divides into sections corresponding to the different stages of the disease. We have, therefore, the treatment, of the phthisical predisposition, that of pulmonary irritation, of the period of inflammation, and of suppuration.

The first stage, or that of predisposition, is, according to Dr. Evans, signalized by a "deficient force of growth," causing atrophy of the red tissues, and muscular weakness, emaciation being sometimes an accompanying symptom, at other times an increased deposition of fat. In the latter case, especially if the pulse retains its ordinary frequency, [some might reasonably doubt wherein the phthisical tendency consists in these instances] in addition to the means presently to be mentioned, the author allows wine and fermented liquors. In the former, these must be strictly prohibited, and in their place we are to exhibit such medicines as are capable, according to Dr. Evans, of diminishing the "conducting power of the nerves," such as opium and hydrocyanic acid. In addition to this, nutritious diet, pure air, &c. are indispensable. In meeting the second indication, or that of the treatment of pulmonary irritation, the author insists upon the necessity of distinguishing whether the irritation be primary or secondary. The treatment varies in the two cases. The circumstances which generally give rise to secondary irritation of the lungs are said to be chronic inflammation of the larynx, womb, and kidneys. The treatment, therefore, resolves itself into that most suitable to the disease to which the pulmonary complication is sympathetic, combined, it may be observed,

with those means best calculated to allay the secondary irritations themselves. The author avoids the mention of the treatment of the uterine and kidney affections, and confines himself to that of the larynx, which consists in mercury, counter-irritation, leeches, seton in the neck, and painting the part externally with iodine or nitrate of silver. The special treatment of the pulmonary irritation is, inhalation of the vapour of water, with counter-irritants, and small doses of opium and prussic acid.

The author now addresses himself to the management of the third stage of phthisis, that of pulmonary inflammation. Here, as he very properly observes, great difficulty arises, in consequence of the fact that those means which are best calculated to subdue the pulmonary inflammation, viz. depletion, &c. are, unfortunately the most likely to confirm the tuberculous predisposition. The practical tact of the physician is shown in the manner in which he steers between this Scylla and Charybdis in therapeutics. It is here that Dr. Evans relies upon the treatment by repeated counter-irritation, the advantages of which he appears to have just appreciated in rather a disreputable school it must be allowed,* but which, if he is to be believed, is a striking instance of the fact, that good may sometimes arise out of evil. The plan he adopts is that of stimulating liniments repeatedly applied to the whole chest, and consisting of equal parts of spirit of turpentine and acetic acid. In the treatment of the suppurative stage, as laid down by Dr. Evans, there is nothing to detain us.

We have thus endeavoured to lay before our readers a brief abstract of the general tendency of the author's views; from many of which we, however, think it right to express our dissent, premising at the same time that there is much that is indicative of unusual practical acumen, and calculated to excite reflection upon a disease which we are all too apt to abandon as inevitably beyond the reach of our art.

That phthisis pulmonalis occasionally undergoes a spontaneous cure has long been believed upon the evidence of the cicatrices and cretaceous remains which are sometimes found to exist in the lungs of persons in whom the disease had either never been suspected during life, or whose pulmonary symptoms had entirely subsided. Dr. H. Bennett† endeavours to prove that this fortunate termination is far more frequent than is generally suspected, and supports his opinion by statistical data, which may be thus briefly recapitulated :—

Of	73	cases examined by himself, cicatrices, &c. were found in	28
	135	. . . M. Boudet, ...	116
	100	. . . M. Rogée	51
	308		195

So that, of 308 cases, the appearance alluded to was found in more than one half. It would afford us much gratification to be able to believe that Dr. Bennett had not overrated the frequency of the spontaneous cure of tubercle as thus supposed to be indicated. But this we cannot do. We do not doubt in the least degree the correctness of the data he has produced, but the deductions drawn therefrom do not appear to us to be in all cases trustworthy. That the presence of cretaceous concretions in the upper lobes of the lung are a proof of the previous existence of tubercular deposit may readily be conceded, but it may be thought questionable whether the puckered cicatrices which, by the author's own admission, are often found to

* Under St. John Long. † Edinburgh Medical and Surgical Journal, April 1845.

exist alone, are in all cases to be referred to the same lesion. The pulling-in of the surface of the lung may be produced by other causes than that of the healing of tubercular cavities, as for instance by that peculiar contraction of the pulmonary cellular tissue described by Stokes under the term *cirrhosis* of the lung, and also as Fournet has shown by the mechanical effect alone of pleural adhesions. With deference to Dr. Bennett, we are constrained to believe that such has been the origin of the appearance in some of his own as well as in the cases of Boudet and Rogée. (14)

Dr. Hennis Green has called our attention to certain striking differences which are to be observed in the phthisis of young subjects, as contrasted with the same disease in the adult. The principal distinction is to be found in the fact that tubercular matter is more generally diffused through the lung in the infant, and that its consentaneous deposition in other organs is more frequent. Unlike the disease as it shows itself in the adult, Dr. Green has also observed that the disease is often more developed in the lower and middle lobes than in the upper, the same locality being commonly the site of caverns, when none exist in the upper lobes. This is a practical fact of great value, and one the knowledge of which may prevent much misapprehension in diagnosis as founded upon the auscultatory phenomena of the disease. The symptoms of phthisis in the child are in many cases exceedingly obscure, since, as has been noticed by Rilliet and Barthez, we are unable to derive the same positive information from the stethoscope as is afforded by it in the adult. The harsh respiration under the clavicle in particular, which is so valuable a sign of tubercular deposition in the latter, may exist to an intense degree in the young child without the slightest lesion of the pulmonary tissue. The cough and expectoration are likewise in the child far from commensurate with the extent of the disease, and hemoptysis loses the value which the investigations of Louis has attached to it in the adult, as it does not occur oftener than once in five times.

It is also difficult in some instances to distinguish tubercular deposition from lobular pneumonia, for, as has already been stated, the locality of the disease will not, as in grown-up persons, afford us any evidence from which the real nature of the consolidation may be presumed. The diagnosis, as stated by Rilliet and Barthez, is founded mainly upon the period at which bronchial respiration becomes perceptible, being much earlier in pneumonia than in tubercular infiltration, and less persistent in the former than in the latter. These are, however, it must be allowed, but indifferent rules, and it is to be feared that there are no positive signs by which a sure diagnosis is to be formed. More assistance will be derived in such cases from the history of the attack, and its amenability to remedial measures than from either the stethoscope or rational signs. (15)

We are indebted to Dr. Addison* for an excellent essay in which he points out the important part assumed by inflammation in all cases of tubercular phthisis. He describes the disease under three separate divisions:—1st. Pneumonic Phthisis; 2d. Tuberculo-pneumonic Phthisis; 3d. Tubercular Phthisis. The first division constitutes one form of what in common parlance is termed "galloping consumption," and may be either acute or chronic. Of the acute form the author recognizes three varieties, one in which some attempt at reparation is made, as is shown by the presence of gray induration; a second, is that of inflammation arising about the circumference of old induration, and destroying both it and the newly-invaded structures together; the third variety not mentioned.

* Guy's Hospital Reports, April 1845.

Of the chronic pneumonic phthisis he admits two subdivisions; one in which old indurations are converted into vomicæ; another in which the lung is universally invaded by gray induration, but is not disintegrated. We regret that the author should seek further to complicate a subject already sufficiently distant from simplicity, by employing the term phthisis in its etymological sense to a disease which has nothing beyond its fatality in common with that to which the term is limited by common consent. We can see no possible good which can compensate for the confusion which may be produced by bringing under the same denomination the affection above described, which is evidently no more than simple pneumonia, and is strictly unconnected with true tubercular consumption.

Under the title of tuberculo-pneumonic phthisis, is described a common form of the complaint in which although tubercles are present, and the lungs may even be studded with them, the efficient cause of the fatal termination is pneumonic inflammation. The tubercles in these cases are of what Dr. Addison terms the *sthenic* kind, and show little disposition to soften.

The third form or Tubercular Phthisis is the disease properly so called, and of which tubercles of the *asthenic* kind form the essential element. In these cases excavations arise from the softening of the tubercular matter itself, and independently of the destruction of the pulmonary tissue. The author concludes his communication by an examination of the several forms of thoracic disease which may be mistaken for phthisis. These are chiefly:— 1. Recent pneumonic inflammation on the upper lobes of the lung; 2. Various forms of pulmonary induration; 3. Pneumonia in the third stage; 4. Simple bronchitis confined to the upper lobes; 5. Dilated tubes; 6. General or partial pleuritic effusion; 7. Pulmonary apoplexy; 8. Malignant disease of the lung.

Antagonism of Phthisis and Intermittent Fever. This remarkable fact first pointed out by M. Boudin, has received further confirmation from the observations of MM. Triber,* Wolheim, Mayer, Gouzee† and Wœmer.‡ M. Fourcault,§ on the contrary, who appears to have examined this affection in a truly philosophical spirit, has come to the conclusion opposed to M. Boudin, that phthisis and intermittent fever are not mutually exclusive, and that if they sometimes appear isolated, they as often co-exist.

In the treatment of phthisis M. Cossy‖ recommends the exhibition of alkalies, combined with the inhalation of ammoniacal vapours, and M. Forget¶ the recurrence to the ancient remedy opium. The former, it may be observed, is an unimportant modification of the method proposed some years back by Dr. Campbell, and has been found by Louis equally inefficacious with all other boasted remedies.

14. *Tubercle.* The anatomical site of the deposit is thus stated by various late writers:—

It is considered to be generally deposited in the elastic cellular tissue of the lungs, less frequently in the air vesicles, and capillary bronchial tubes, by Lebert;** in every structure which enters into the composition of the lungs, in the coats of the pulmonary artery, in the walls of the bronchial

* De l'heureuse Influence de l'Atmosphère marécageuse sur la Tuberculisation, Paris, 1844.

† Schmidt's Jahrbücher, 1845, No. II. 451 Band, 2 Heft, p. 169. ‡ Ibid.

‖ Archives Générales de Médecine, Dec. 1844.

§ Causes Générales des Maladies Chroniques, 8vo. Paris, 1844.

¶ Bulletin Général de Thérapeutique, Dec. 1844.

** Muller's Archives, No. 2 and 3, 1844.

tubes, in the air cells, and upon and under the pleura, by Sibson;* in the interior of the pulmonary cells and the minute bronchial tubes, by Nicolucci and Mr. Rainey.† Tubercle is considered to be a modified form of albumen by Evans‡ and Bennett;§ to have no analogy to pus, by Lebert, or to fibrin, by Rainey. According to the observations of the latter writer, tubercle may be distinguished from fibrin by an examination of the neighbouring capillary vessels. Those adjacent to tubercle retain their natural character, those, on the contrary, which are seen in the vicinity of a fibrinous deposit, are tortuous and varicose. These observations, it may be remembered, are to a certain extent at variance with the researches of Guillot and Van der Kolk mentioned by Louis, (*Walshe's Transl.* p. 29), namely, that the branches of the capillary pulmonary vessels, so far from being natural, stop short as they approach tubercular deposit, leaving a space of about two lines in breadth, which for a time at least remains perfectly destitute of vascularity.

The inflammatory origin of tubercle is maintained by Bennett, Evans, and Sibson; denied by Nicolucci‖ and Lebert. We have thus, it appears, made no nearer advances to the settlement of the question. The doctrine of the inflammatory origin of tubercle has, however, always appeared to us untenable; for, setting aside the objections arising out of the relative topographical statistics of this product, and those of inflammation, as established by Louis, there are others to be adduced, which it is equally difficult to reconcile with the doctrine. Tubercle undoubtedly exists as such in the blood; it must therefore either coexist with the fibrin, or be supplementary of it. The latter supposition is entirely negatived by the researches of Andral and Gavarret, which demonstrate that the blood of phthisical patients contains more fibrin than that in any other disease, the pure phlegmasiæ excepted. We must therefore, of necessity, admit their coexistence in the blood. This being granted, the question of the origin of tubercle, as far as inflammation is concerned, is reduced within very narrow limits. Either the same vital action, i. e. inflammation, existing in capillary vessels, which are separated from each other by inappreciable distances, is capable of giving rise, at the same time, to two totally different products, namely, tubercle and fibrin,—or we must conclude that these products originate in a different vascular action. In other words, we must believe, if we hold the inflammatory theory, that the tubercular deposition, and the chronic induration in its immediate vicinity, the latter a pure fibrinous exudation, are the result of the same action in contiguous capillary branches. Now, although we do not maintain that it is impossible, we must yet hold that it is improbable that, when the blood holding both the fibrin and tubercular matter in solution, arrives at the site of two given capillaries—one supplying one cell, the other the next—these vessels should be capable of exercising a kind of elective affinity; and one under inflammation, allow the exudation of tubercle—the other, of the true blood-plasma. The difficulty is only to be avoided upon the supposition that, of these two processes, namely, tuberculization and pneumonic exudation, going on, as they assuredly do, at the same time, the latter alone is inflammatory, the other is the product of some other kind of vascular action, most probably that which in healthy subjects is subservient to normal nutrition.

On the subject of the general pathology of tubercle, we may direct atten-

* Op. cit. P. 470 et seq.

† Paper read before the Medico-Chirurgical Society, March 25, 1845

‡ Op. cit. § Vide Abstract, art. 14.

‖ Encyclographie des Sciences Médicales, Janv. 1845.

tion to a memoir by Dr. Cless,* to another by Engel,† and to the researches of Lebert, before alluded to, the summary of which will be found in our Abstract (35).

15. *Asthma.* Mr. Harrison‡ has recommended a trial of the fumes of nitrate of potash, in spasmodic asthma, during the paroxysm. The room which the patient occupies is to be filled with the fumes by burning paper which has been dipped in a saturated solution of the salt. This suggestion is not new, the plan having been some time since adopted in America; it is, however, worthy of attention, from the facility with which its powers may be tested.

16. *Black Pulmonary Matter.* The dark-coloured deposit which is frequently found in the respiratory organs of old persons, has been minutely investigated by M. Guillot,§ without, however, his having contributed much to the elucidation of the subject. The appearance in question was, it is well known, first described by Laennec, and was by him, as well also as by many subsequent writers, attributed to the inhalation of carbonaceous matters. In the cases which are referred to by the author, this opinion could not be entertained, as the patients had never been exposed to circumstances under which the inhalation of such matters was likely to occur. The theory which is favoured by M. Guillot, is that which was long since enunciated by Dr. Carswell, (*Cyclopæd. Pract. Med.*—Art. *Melanosis*,) namely, that it is due to stagnation of the blood in the pulmonary tissues. This view of the case is supported by the consideration, that the instances in which this discoloration of the lung is found, are exactly those in which we should *a priori* expect the pulmonary circulation to be liable to congestion and stagnation; namely, in the old, and in persons whose lungs are emphysematous. Although this black deposit is a physiological rather than a pathological change, it is capable, when it occurs in great abundance, of producing serious mechanical inconvenience, by obstructing the capillary vessels and respiratory canals. The remarkable property possessed by this matter, as stated by M. Guillot, is its power of inducing a modification in tubercular matter. He believes that it operates as a spontaneous check to the further deposition of that product, by obliterating the new system of capillary vessels, which, he has observed, replaces the obstructed capillaries of the pulmonary artery.

17. *Empyema.* This subject has met with a considerable share of attention of late, more particularly in reference to the operation of paracentesis. Upon the safety and propriety of this operation, the profession is still as much as ever divided; some maintaining the opinion of the late Dr. Hope, that all cases which are curable with, are also to be cured without it; others holding an intermediate opinion, that it is only to be advised as a dernier resort, to avoid impending suffocation; others, again, contending for its positive utility as an early procedure. Among the supporters of the latter view, Dr. Hamilton Roe is pre-eminent, having furnished us with a valuable essay, which will be found in a condensed form in the preceding part of this work (16), and the object of which is to show, by numerical proof, that the operation is both safe and advisable, whenever the fluid either fails to be absorbed, or is clearly ascertained to be purulent. For a

* Beiträge zur Pathologie de Tuberculose. (Rose's Wunderlich. Archives, III, iv.) Schmidt's Jahrbücher, No. ii, 45 Band, 2 Heft.

† Ibid. No. iii, 3 Heft.

‡ Lancet, April 5, 1845.

§ Archives Générales de Méd., Janv. Fev. Mars. 1845.

more detailed account of the author's practice, in order to avoid repetition, we refer our readers to the Abstract, premising that, although we cannot entirely agree with him in the favorable views which he takes of the operation, we must admit that he has placed it before the profession in a far more enticing shape than had been done by any preceding writer.

Among other information connected with the subject of paracentesis or empyema, we may mention a report of four cases operated upon by M. Roushille,* three of which were fatal; and of three performed with success by M. Trousseau† in the last stage; Dr. Dorup‡ also speaks of it in favorable terms, and M. Lutjaerens§ has reported a case in which a cure was obtained under the most unfavorable circumstances by the injection into the pleura of a weak solution of iodine.

Dr. M'Donnell‖ has remarked the existence of a peculiar crepitation in the lungs after the absorption of pleuritic effusion. This sign he endeavours to explain upon the supposition that it depends upon the entrance of air into the lung which had been compressed, and which from its compression has also become œdematous. This view of the phenomenon has subsequently been supported by Dr. Ojier Ward,¶ having been called in question, as it appears very justly, in the editorial remarks of the *Lancet*, and there referred to that class of sounds which are known to be produced by the contact of roughened serous surfaces. Whatever be the true theory of the production of this phenomenon, Dr. M'Donnell is not the first to notice it, as it has been long since alluded to by Gendrin, and more recently by M. Damoiseau. (*Archives Générales de Médecine*, 1843.)

18. *Pneumonia.*—On the pathology of this disease the only remarks worthy of record are those of Mr. Sibson, contained in the valuable paper above alluded to, and those of M. Prus.¶ The essential and primary seat of the disease is stated by the former writer to be, the capillary branches of the pulmonary artery and vein, the coats of which vessels become, through a "modification in their cell-life," soft and yielding. He agrees with Stokes in discriminating a stage prior to this, in which the minute crepitating bile is observed, and which is recognized by an increased and hissing vesicular respiration. M. Prus, in the memoir above alluded to, has examined the different theories upon the subject of the primary seat of pneumonia with great minuteness. After criticising the opinions of Laennec, Andral, Lobstein, Grisolle, and other French writers, he pronounces his adherence to the opinion which has been previously somewhat indefinitely stated by Lallemand, that pneumonia is essentially an inflammation of the intervesicular cellular tissue, and does not necessarily involve any lesion of the bronchial tubes or air-cells.

In the treatment of the suppurative stage of pneumonia the iodide of potassium is much praised by Dr. Upshur. We have frequently had occasion in practice to witness the advantages which the author attributes to this remedy, particularly in the pneumonia of infants, as it occurs during the progress of or immediately after measles. (19)

* Journal de Médecine de Bourdeaux.

† Acad. Royal de Méd. Séance Mai 25, 1845. Reported in Archives Générales de Méd. Av. 1845.

‡ Paper read before Scandinavian Naturalist Society, from Bibliothek fur Læger. by Dr. Otto, 1844.

§ Gazette des Hôpitaux, Feb. 6, 1845.

‖ Dublin Journal, Jan. 1845.

¶ Revue Médicale, Avril 1845.

§ IV.—*Diseases of the Circulating System.*

19. *Diseases of the Heart.* The contributions to the study of the diseases of the heart and great vessels during the preceding six months are principally those by Drs. Bellingham, Furnival, and Christison, and MM. Forget and Gendrin. The observations of Dr. Bellingham, which will be found at length in another part of this work (19), are valuable for the clearness with which the physical signs of valvular disease in particular are laid down. In common with the majority of auscultators, he considers regurgitant diseases of the mitral valve to be indicated by a "bruit" with the first sound, most distinct under the left nipple. In regard to this point we may be allowed to state, that it has long been our opinion, founded upon careful clinical observation, that disease of the mitral valve does not give rise to any bruit whatever, and that, in fact, we have no means of diagnosing the lesion, excepting by reference to the pulse, which is in itself almost pathognomonic. In looking lately through a list of cases of mitral valve disease, we have been able, within certain limits (not as extensive as might be wished, it must be allowed), to gain a numerical confirmation of these views. Of 14 cases of mitral disease as ascertained by post-mortem examination, a bruit with the 1st sound existed in 8, and none in 6. This at first sight might appear to favour the common opinion; but we further find, that out of these 8 cases, another cause capable of generating the "bruit," namely, obstructive disease of the aortic valve, existed in 6. On the other hand, in the 6 cases of patulous mitral valve in which no bruit was perceptible, neither was there, with one exception, any coexistent disease of the aortic orifice. The exception alluded to, it may also be observed, is not in reality one to which any value can be attached, for the aortic orifice was in that case reduced to a rigid narrow ring, a condition which is generally allowed to be incapable of generating a bruit. We conclude, therefore, as far as so small a number of observations will warrant our coming to any deduction at all, that a patulous condition of the mitral valve does not give rise to a "bruit," but that the sound heard in such cases is due to a coexisting lesion of the aortic orifice.

Dr. Furnival's work* is a careful resumé of the ordinarily received doctrines of the day, but adds little to our previous knowledge. He particularly insists upon the advantage of giving alkalies in the treatment of acute rheumatism, as a means of preventing cardiac complication. The formula preferred by him is:—Liq. potassæ ʒss; Vin. colchici ♏ xx; Infus. sennæ, or Aquæ menthæ ℥j three times a day. He likewise speaks highly of aconite as a sedative in heart disease, and considers it in all cases preferable to digitalis.

M. Forget† considers that too much value is attached to valvular sounds in the diagnosis of diseases of the heart. He thinks that in order to arrive at a correct diagnosis, it is necessary to determine the relative frequency of the lesions of the different orifices, and the relations of those lesions to hypertrophy and dilatation of the parietes. The results of the analysis of several hundred cases has shown him, that the most conclusive sign of a contracted aortic orifice, is dilatation, and generally also hypertrophy of the left ventricle. This is indicated by bulging in the præcordia, increased

* Diagnosis, Prevention, and Treatment, of Diseases of the Heart, &c. 8vo. London, 1845.

† Memoir to the Acad. des Sciences Medicales. Reported in Lancet, Nov. 1844.

impulse, and bellows-sound along the track of the aorta. This state of the left ventricle implies also passive dilatation of the other three cavities, so that in disease of the aortic orifice the whole heart is enlarged, giving rise to increased dull space in the præcordial region. Contraction of the mitral orifice is followed by dilatation of the three cavities behind it, but the left ventricle remains undilated. In this case there is neither præcordial bulging, nor increased dullness on percussion.

The practical deductions drawn by the author from these views are,—that in aortic stricture, with hypertrophy and dilatation of the left ventricle, debilitants and sedatives may be used without fear; whereas in cases of mitral stricture, these means must be used with caution, as the left ventricle not being thickened, requires all its energy.

20. *Pericarditis.* The occurrence of this disease as a complication of scarlatina, has already been mentioned (vide p. 3.) Mr. Sibson* speaks of a mild form of pericardial inflammation, which he believes to occur some time or other in the life of almost every individual. He is induced to come to this conclusion from finding a small quantity of fluid, and a delicate fibrinous deposit on the auricular appendages in the majority of post-mortem examinations in persons dying of lingering disease of the chest, injuries, &c. which came under his notice.

21. *Aneurism.* The diagnosis of aneurisms of the aorta forms the subject of a comprehensive paper by M. Gendrin, for which we refer to a former part of this work (22), and is also briefly alluded to by Dr. Furnival.†

A peculiar form of dissecting aneurism of the aorta has been described by Dr. M'Donnell,‡ in which the blood had taken a double course, one downwards behind the sigmoid valves, which eventually burst into the pericardium, the other upwards separating the arterial tunics as far as the inominata and subclavian vessels. The symptoms of this lesion are well shown in a similar case which is recorded by Dr. Todd in the 27th vol. of the *Medico-Chirurgical Transactions.* These appear when the disease occurs suddenly, to be in the first place, a state of syncope, which is evidently due to the sudden abstraction of a large quantity of blood from the general circulation, and its impulsion into the new-formed channel. The tearing away of the cellular tissue connecting the coats of the artery before the column of blood, was in the above case announced by a severe anomalous pain in the course of the arterial trunk.

§ V.—*Chylopoietic System.*

22. *Liver. Cirrhosis.* Dr. Corrigan insists upon the necessity of paying attention to the early symptoms of this disease, as it is in the initiatory stage only that remedial measures can effect any permanent good. The affection is ushered in by repeated attacks resembling "cholic," which are apt to come on after meals, with pain at the top of the shoulder, vomiting, more or less jaundice, and occasional slimy stools tinged with blood. In the treatment of this condition of things, nothing can be done without total abstinence from ardent spirits and other stimulating liquors, which the patient is prone to indulge in, under the impression that they will relieve the colicy pains by which he is harassed. In addition to this, Dr. Corrigan advises cupping or leeching over the hypochondrium, and the exhibition of mercury until gentle ptyalism is established. When this has been

* Op. cit. p. 523. † Op. cit. p. 176. ‡ Medical Gazette, March 2, 1845.

maintained for two or three weeks, we may have recourse with great advantage to this trisnitrate of bismuth. (24)

23. The causes and treatment of *biliary calculi* are thus stated by MM. Duparcque and Dufresne.* The causes are the phlegmatic constitution, sedentary habits, too animalized a diet, and the prolonged sojourn of the bile in the gall-bladder. The treatment, according to the authors, is to be conducted upon three principles:—1st. To dissolve the concretions; 2d. To facilitate their expulsion; and 3d. To induce such a modification in nutrition as shall prevent their recurrence. In order to fulfil the first indication, alkalies, and especially Vichy water, are the authors' favorite remedies. The second indication is attempted by the exhibition of a mixture of two parts of spirit of turpentine and three of ether; or by one of castor oil sixty parts, ether four parts, and sugar thirty parts, the dose being a teaspoonful every hour. The two remedies which are so much depended upon in this country, namely, opium and the warm bath, are not alluded to. The method of carrying out the third principle of treatment is determined by the manner in which the gall-stones are formed. This in the belief of the authors is by the conversion of the fatty matters, and they accordingly recommend abstinence from food rich in oleaginous principles, combined with purgatives, vegetable diet and exercise.

24. That condition of the liver which is familiar to us under the name of *nutmeg liver*, has recently been submitted to microscopical investigation by Vogel.† The researches of this observer confirm the ordinary opinion that the appearance is caused by irregular congestion of the organ, and shows that it depends directly upon the contrast exhibited between the pale substance of the hepatic lobules, and the intensely reddened interlobular tissue.

25. A case is described by Dr. Frey‡ under the denomination of inflammation of the vena porta, in which the symptoms were those of phlebitis in general, with the exception that delirium did not occur until the agony of death. This circumstance is accounted for by the author, upon the supposition that the pus did not gain access to the general circulation, being stopped in the portal capillary vessels. The case was fatal, and after death pus was found in the mesenteric, splenic, and in the veins in general which contribute to form the portal circulation.

26. *Abdominal Pulsation.* This is a symptom of very frequent occurrence in practice, and as it is one which never fails to awaken feelings of alarm in the mind of the patient, it will be advantageous to have a clear recollection of the various circumstances under which it may arise. These are well described in an article by Dr. Nottingham, to which the reader is referred. (27) As far as our own experience goes, it is nine times out of ten an unimportant symptom, and is readily subdued by the nitrate of silver in $\frac{1}{4}$ grain doses, or by the bicarbonate of potash and hydrocyanic acid. The theory of the production of the pulsation is not in all cases very evident, but in those cases in which it is complained of by the patient without being perceptible to the medical attendant, it is probably due to an exalted state of nervous sensibility of the stomach, whereby the pulsations of the subjacent aorta, ordinarily unnoticed, become more or less plainly perceived.

27. *Stomach. Perforating ulcer.* A case of this lesion is reported by

* Recherches sur la Digestion. In annuaire de Thérapeutique, 1844.

† "Erläuternungstafeln zur pathologischen Histologie." Translated by W. Kirkes, Esq., Medical Gazette, May 16, 1845.

‡ Heidelberg Annalen, t. x, 2, 1844, in Schmidt's Jahrbücher, No. 1, 1845. P. 33.

Dr. Barlow,* which is chiefly worthy of mention in consequence of having given rise to a peculiar condition of parts calculated to throw great obscurity over some of the phenomena of auscultation which are in general the least liable to misconception. The contents of the stomach being extravasated through a circular ulcer, instead of giving rise to general peritonitis, excited only a circumscribed inflammation, so that a large cyst or abscess was formed communicating freely with the stomach. The contractions of the diaphragm in this case causing the passage of air from the stomach to the adventitious cavity, and vice versâ, gave rise to many of the symptoms of pneumothorax with pulmonary fistula, such as amphoric resonance, metallic tinkling, &c. so that during life the pleural sac was considered to be the part chiefly involved. The case is well reported, and together with the remarks of Dr. Barlow is deserving of attentive perusal.

28. *Intestinal obstruction.* There are few circumstances in which the diagnostic acumen of the physician is more frequently put to the test, than in the discrimination of the exact site of disease in cases of internal obstruction of the bowels. This difficulty may be in some cases materially diminished by the application of certain observations lately published by Dr. Barlow.† This author has noticed that a difference is to be found in respect to the urinary secretion, according to the seat of the obstruction. When this is situated in the lower part of the intestinal tube, the renal secretion is little, if at all affected; but when it is higher up, near the duodenum, the secretion has been observed to be more or less completely suppressed. The explanation of this phenomenon is to be found in the fact, that if the obstruction be high up, a small quantity only, or no fluid at all can gain access to the intestines; and absorption is consequently in the same proportion prevented. If the fact be one of general occurrence, Dr. Barlow will have rendered material service to the department of diagnostics, by his notice of it.

The large intestine has several times of late been opened in the lumbar region, as a remedy for insurmountable obstipation. The latest case on record is one by Mr. Evans of Derby, making the eleventh in which Callisen's operation, as modified by Amussat, has been performed in the adult. This patient recovered from the immediate effects of the operation, but died in consequence of subsequent imprudence.

29. *Dysentery.* A severe form of epidemic dysentery has lately been observed in a union house near Tunbridge Wells, in which the mortality has been as high as one case in four. All methods of treatment appeared to be unsuccessful, until it occurred to Dr. Wilmot to exhibit creasote enemata in the strength of ℥j to ℥xij of starch. Under this plan a rapid amelioration took place.

30. *Peritoneum.* Dr. Spittal§ mentions a phenomenon attending peritoneal inflammation, which although known as far back as the time of Laennec, has not much attracted the attention of succeeding pathologists. This is a friction sound, analogous to those produced in the pleura and pericardium, and, as in those membranes, depending upon the contact of inflamed serous surfaces. The mechanism by which the peritoneal friction sound is produced is threefold: 1, The respiratory movements and descent of the diaphragm; 2, Pressure on the abdominal parietes by the hand; and 3, the peristaltic action of the intestinal canal. The subject is worthy of

* Medical Gazette, May 3, 1845. † Guy's Hospital Reports, October 1844.

‡ Medical Gazette, May 23d, 1845.

§ London and Edinburgh Monthly Journal, May 1845.

deeper investigation than has hitherto been accorded to it, as it is likely to prove a valuable auxiliary source of diagnosis, not only in peritoneal inflammation, but in cases of abdominal tumour.

§ VI.—*Genito-urinary System.*

31. In this branch of pathological study we have to notice the recently published and excellent work of Dr. Golding Bird, the object of which is to supply, in their simplest form, the rules for the discrimination and treatment of the various forms of urinary deposits. As we have in a former part of this work (28) given an abstract of many of the principal matters contained in the work, we shall merely take a passing survey of its contents in the present place, directing the attention of our readers more especially to the treatment. In the remarks upon the management of the deposits of uric acid and its compounds, we do not find much to arrest our attention, the rules there laid down being, for the most part, such as have long been familiar to the profession. The author, however, introduces one or two observations which are deserving of farther publicity. One of these is in reference to the common practice of exhibiting soda as an antacid. On this subject he cautions us that in many constitutions the continual use of alkaline carbonates is productive of much disorder, and refers to the opinion of Prout, that it occasionally induces the formation of the oxalic diathesis. The other observation to which we allude is with regard to the use of the biborate of soda, which Dr. Bird states cannot be given to females with impunity, as it has been known in two instances to induce abortion.

The most valuable portion of the work is undoubtedly that which treats of the oxalic diathesis; for we have in the chapter devoted to the subject a development of that particular pathological state such as had not previously been accomplished. This diathesis appears from the investigations of Dr. Bird to be far more common than is supposed, and gives rise to a train of symptoms, which may readily be mistaken for hypochondriasis or spermatorrhœa, with which latter malady it is often associated. Dr. Bird demonstrates, as it appears to us very satisfactorily, the non-dependance of this diathesis upon the presence of sugar in the system; for neither on the one hand has he found oxalate of lime deposits in diabetic urine, nor sugar on the other in that which contains the oxalate of lime. The origin of the salt he considers to be by the conversion into oxalic acid, by the vital chemistry of the kidney, either of urea, or of the elements which in a state of health would have produced that substance. In the treatment of this state of system, the author speaks very favorably of colchicum; but the principal indications are those of strengthening the digestive powers, and to induce a healthy action of the skin, which are readily accomplished by the mineral acids, the sulphates of zinc and iron, and the shower-bath.

32. *Albuminuria.* The most important notice which this disease has received during the preceding six months is to be found in the admirable clinical lectures of Dr. Corrigan,* who considers the pathological condition of the kidney to be analogous to that which is known as it occurs in the liver, by the term *cirrhosis.* The first stage of the disease consists in a state of hypertrophy, caused by the deposit of lymph, not, as has been supposed, in the tubular structure of the kidney, but in the intervening cellular tissue; the second stage, as in the liver, is marked by contraction.

* Medical Times, April 5th, 1845.

These two conditions according to Dr. Corrigan, are widely different as to curability: the latter is perfectly irremediable; the former may be removed by judicious treatment. The symptoms are also, he observed, sufficiently distinctive to enable us to recognize the two stages. In the hypertrophied kidney "the urine is abundant, sometimes tinged with blood, albuminous, specific gravity but little altered, with dry skin and pains in the loins. If in addition to this the specific gravity is low, 1·010, and albumen is still present, there is little doubt that contraction has set in, and the prognosis is correspondingly unfavorable.

M. Fourcault,* in a work recently published upon the causes of chronic diseases in general, gives the following rationale of the occurrence of albuminuria. He had long observed that the presence of albumen in the urine, in by far the majority of cases coincided with notable derangement of the functions of the skin. Struck with this circumstance, he had recourse to experiment to determine whether the two events had any necessary connexion. The result was, that in artificially suppressing the cutaneous transpiration, he induced albuminous urine. The explanation of the fact is founded upon the hypothesis that the albumen of the blood is retained in a fluid condition by a chemical union with soda, which alkali is neutralized by the lactic acid retained in the circulation in consequence of its non-elimination by the skin. The albumen thus isolated is rendered as it were an effete element, and is, therefore, discharged by the kidney as the most active emunctory of the body. The feasibility of this theory is, according to the author, supported by further experiments, in which he injected lactic acid into the veins of different animals, with the constant effect of causing the appearance of albumen in the urine. These observations which are for the most part in accordance with the views of Mr. Ross† upon the same subject, are deserving of close attention, for they, if true, entirely subvert the opinion, of the illustrious physician whose name has by common consent been accorded to the disease for the elucidation of which he has done so much. In fact, if the skin have in reality so great an influence upon the appearance of albumen in the urine, we must undoubtedly cease as hitherto to regard the congestive or inflammatory lesion of the kidney as of primary consequence in the causation of the disease. We, however, look upon this branch of pathological inquiry as far from being satisfactorily determined. We know thus much, that there exists a train of symptoms indicating a generally fatal combination of pathological conditions, but of the three main elements of the disease in question,—the presence of albumen in the urine, the appearance of dropsical effusions, and the concomitant lesions of the kidney: we are not able, as it appears to us, as yet to determine the respective place in the series of morbid actions.

The treatment of albuminuria will be found to be well described by Dr. Williams. (30) In the early stage of the disease in which there is usually more or less pain in the back and loins, local abstraction of blood by cupping will be found of material benefit. The dropsical symptoms may be attacked by hydragogue cathartics, diaphoretics, &c. Diuretics are, according to Dr. Williams, unsafe until the renal congestion has been in a measure removed. In the chronic form of the disease, Rayer recommends small doses of tincture of cantharides, and Mr. Kidd,‡ the establishment of an issue in the loins. We regret that we do not find more specific notice of

* Causes Générales des Maladies Chroniques, &c. Paris, 1844, and Revue Médicale, Avril, 1845, p. 326.

† Lancet, August 1844.

‡ Dublin Medical Press, Jan. 15, 1845.

the treatment of some of the more urgent symptoms attendant upon that fatal malady; as for instance, of the vomiting which in many cases forms so insurmountable an obstacle to the administration of medicines, and by the rejection of all food tends mainly to the fatal determination. On the subject of treatment of albuminuria as it occurs after the eruptive diseases, we have already had occasion to remark in a former part of this Report.

§ VII.—*Diseases of Uncertain Seat.*

33. *Scrofula.* The most recent, and, at the same time, the most important communications with respect to this common source of the deterioration of the human species, are to be found in the late work by M. Lugol, of which we have had the honour of producing an English translation.* The object of the work is strictly confined to the investigation of the causes of the disease, the author having, as he conceives, sufficiently exhibited his method of treatment in former publications. The main peculiarity in the author's views consists in the great development which he has given to hereditary influences in the causation of the disease, and the small share which he believes external agents to possess, when hereditary taint is not also present. No combination of circumstances in fact can, according to him, make a healthy man scrofulous. These views are unquestionably startling, from the implicit faith with which we have been accustomed to receive the doctrine of the influence of impure air, and bad food, in the production of scrofula; and it is to be regretted assuredly that the author had not followed the philosophical Louis in the mode in which he has related the results of his investigation. Now, although it is not our intention to defend M. Lugol from the accusation of inexactitude with which many of his dicta have been received, we must be allowed to suggest that assertions coming from the lip of a man, who, like Lugol, writes a book not to get a name, but at the end of a thirty years' experience, and on the point of retiring from the profession, might be received with a less amount of the support afforded by figures than under other circumstances we should require. The author, among other points, in which he differs from preconceived opinions, states as his experience, that scrofula is most frequently shown in persons with dark hair and complexion. "Scrofula," he observes, "rarely shows itself in persons of light hair and complexion; more than half are dark, and among the remainder the hair is generally of various shades of auburn." As far as our own observations have gone, and we have, since our attention has been so directed, made many inquiries in reference to this particular point, they coincide with those of M. Lugol.

The circumstances under which scrofula may be inherited, are, as M. Lugol observes, more numerous than is commonly known. Not only may an individual actually labouring under scrofula at the time of begetting offspring, transmit to them his cachectic constitution, but he may do so if he at any time has been scrofulous, even although he should be apparently cured. It appears, also, that even if he have not exhibited signs of scrofula in his own person, his children are nevertheless not exempt, if his brothers or sisters suffer from the disease; for M. Lugol regards it as an axiom, that if one member of a family be scrofulous, the others are so also in a greater or less degree. Phthisical parents may beget scrofulous children; as may also those who are labouring under secondary syphilis; those who

* Researches and Observations on the Causes of Scrofulous Diseases: London, 1844.

marry too early or too late; who are disproportioned in age, or in the physical vigour of the sex; or who have committed venereal excesses. Lastly, scrofula may be inherited from maniacal, epileptic, and paralytic parents. In point of fact, any circumstance which gives rise to debility in the reproductive system in the parent, may become a source of scrofula in the child.

Our space will not allow of a minute analysis of M. Lugol's important work; we shall therefore pass on to a subject which is nearly allied to scrofula, namely,—

34. *Cretinism.* The pathological history of the degenerate races inhabiting the humid valleys of the Alps, has lately been extended by the labours both of British and continental writers; among which, we shall mention those contained in an interesting brochure by Dr. Wells.* The first part of this work is occupied by a physiological discussion upon the origin of the term *cretin*, and by an account of the authors who have written upon the subject. He then proceeds to the description of a cretin, and to the consideration of the proximate cause of the degeneration. It appears, according to Dr. Wells, that cretinism is not hereditary, but that it shows itself usually for the first time about the period of dentition. In this view, however, he is at variance with Dr. Rösch,† who has likewise minutely investigated the disease. The proximate cause is stated to be "an imperfect development of the individual, dependent upon the condition of the blood, which is deficient both in quantity and quality." The author combats the opinion that cretinism and goitre arise from any peculiarity in the Alpine waters, but agrees with Dr. Rösch, in attributing the condition entirely to the injurious operation of the warm damp atmosphere which stagnates at the bottom of the Alpine valleys. The subject has also been noticed in a paper published in the *Transactions of the Vienna Medical Association*, by Dr. Knolz,‡ and in a work by Dr. Troxter §

35. *Rheumatism.* M. Legroux‖ has for some time abandoned bleeding in the treatment of acute rheumatism, and has relied entirely upon the sulphate of quinine. The effects of this medicine are stated by him to be threefold: 1, primary or local; 2, physiological or secondary; 3, therapeutic. The latter only need here occupy our attention. The action of the circulating system seems especially modified by the medicine, the heart's pulsations diminishing rapidly both in force and frequency. The skin at the same time cools down to its natural temperature. The articular affections do not undergo any notable amendment before the third or fourth day, but after that day they rapidly progress towards recovery. The following is a statistical statement of M. Legroux's experience:—Of 24 cases, some had been ill two or three days, others for six or seven, some as long as a month; the mean duration of illness at the commencement of the treatment was ten days. The duration of the treatment in the successful cases, was 3 days in two, 4 days in six, 6 days in four, from 8 to 9 in four, from 12 to 15 in two; the mean duration, therefore, was 6 days. Of the twenty-four patients, 19 were completely cured; in fact, this change from disease to health was almost sudden; there appeared to be no intermediate state of convalescence. The other 5 had a relapse, but were eventually cured by the same means.

* Essay on Cretinism and Goitre. London, 1845.

† Untersuchungen uber der Kretinismus. Erlangen, 1844.

‡ Vide British and Foreign Medical Review, April 1845.

§ Der Cretinismus in der Wissenschaft. Zurich, 1844.

‖ Journal de Médecine, Encyclographie Médicale, Avril 1845.

Of these 24 cases, there was heart complication in 7; but this did not appear to be influenced in any manner by the quinine.

The preceding facts and considerations lead M. Legroux to the following conclusions:—

1. The sulphate of quinine is a powerful sedative of the circulation.

2. It exercises a powerful influence over the duration and progress of articular rheumatism; it diminishes the symptoms; and probably tends more than any other medicine to prevent the intercurrence of cardiac disease.

3. Given in small and divided doses, it is free from all danger and inconvenience.

4. It often succeeds alone; but it is often useful to associate with it one or two bleedings.

36. *Diabetes.* Dr. Watts* has reiterated his opinion, that the proximate cause of this disease is to be sought in the assimilating organs, and that the kidneys are not essentially implicated in the disease, merely acting as emunctories for the sugar, with which, by a vice in the digestive organs, the blood is surcharged. He shows, on the authority of Liebig, that certain articles, such as sugar, starch, gum, &c., in a healthy stomach, are converted into oleaginous secondary principles, which, like the saccharine, are destitute of nitrogen. A further change is then effected by their being converted into animalized, that is, azotized principles, such as are necessary for the constitution of the various tissues of the body. It, however, happens, under certain forms of disease, that digestion is interrupted in one or other of these stages of assimilation, and effects are produced, which vary according to the particular stage at which the suspension of assimilation takes place. In the case of non-nitrogenized principles, if the assimilation has ceased after the conversion of the saccharine into the oleaginous principles, this imperfectly assimilated aliment is, according to Dr. Watts, deposited in the form of fat. Hence, with him, the production of great obesity is one of the precursors of diabetes. If, however, the digestion has not proceeded further than the conversion of the amylaceous matters into the saccharine principle, this remains as an effete matter, and is eliminated by the kidneys and in the alvine discharges. The peculiarity of the views of Dr. Watts, then, consists in his regarding diabetes as made up of three stages: the first, which is essential, and consists in inflammatory gastric dyspepsia, as a consequence of which, the conversion of the non-azotized into the azotized principles is incomplete; the second, which is not essential, and is therefore occasionally absent, in which, from the mal-assimilation of the oleaginous principles, these are deposited in the form of fat; and thirdly, that which is generally recognized as diabetes, in which the digestive process gives rise to a low form of sugar, but is incapable of accomplishing its further assimilation. This supposed connexion of obesity with subsequent appearance of diabetic symptoms, is worthy of further investigation, but we are not aware that it has been insisted upon by any other writer.

In the treatment of diabetes we refer with gratification to a paper by Dr. Imray (37), in which the influence of warm climates upon the disease is shown to be of paramount importance. A subsequent article likewise contains the report of a case supposed to have been cured by the Peruvian balsam. (38).

37. *Action of Medicines. Narcotics.* Dr. Pickford,† of Heidelberg, has made the modus operandi of narcotic medicines the subject of a

* Lancet, April 19 and 27, 1845. † Archives fur Physiologische Heilkunde.

valuable inaugural dissertation. His conclusions may be thus briefly recapitulated:—

1. A narcotic becomes active only when it enters the circulation.

2. It enters the circulation through the medium of the veins, and not by the lymphatics.

3. Since it is impossible to detect the narcotic either in the blood, or in any component part of the body, it must be allowed to have a special effect upon the nervous mass, the blood being simply the vehicle of the poison.

4. The action of a narcotic differs sensibly, accordingly as it acts directly upon the nervous centres, or only upon a particular nerve.

5. A powerful dose of narcotic poison destroys life by a direct action upon the nervous centres; in smaller doses it kills by its action upon certain nerves, as those of the heart.

6. The nearer the nervous centres that a narcotic poison enters the circulation, the more rapid the death.

Diuretics. In the explanation of the modus operandi of diuretics, Dr. Bird* alludes to the two following laws:—1st. That substances intended to reach the kidneys must either be in solution, or be readily soluble in the fluids contained in the stomach. 2d. That the solution of these substances must be so diluted as to be of considerably less specific gravity than the liquor sanguinis or serum, i. e. less than 1·028. This strikes us as an important law, and one which is not sufficiently attended to in extemporaneous prescriptions. It readily explains why two drachms of the acetate of potash in a given quantity of water will excite diuresis, while half an ounce in the same quantity will purge. The author has made some remarks upon the laws which are specially worthy of recollection. After alluding to the course which diuretic medicines must take before they reach the kidneys, viz. through the liver and ascending cava to the heart, and thence through the lungs back to the heart, and through the aorta, he observes that when an obstruction exists in any part of this course, a diminished supply of water reaches the kidney. For example, a patient labours under a contracted condition of one of the auriculo-ventricular openings, and dropsical effusions ensue, or he has a contracted liver, and the portal system is consequently obstructed. In cases of this kind no good can arise from goading the kidneys by diuretics, unless the obstruction can first be remedied. This is a point not sufficiently reflected upon in practice, or we should not see stimulating diuretics, as cantharides and squills, so promiscuously given in dropsy, without reference to the condition of the heart and liver. Dr. Bird concludes with these practical suggestions:—

1. Whenever it is desirable to impregnate the urine with a salt, or to excite diuresis by a saline combination, it must be exhibited in solution so diluted as to contain less than five per cent. of the remedy, or not more than twenty-five grains in an ordinary draught. The absorption of the medicine may be ensured by a copious draught of water or other diluent, immediately after each dose.

2. When the urine contains purpurine, or other evidence of portal obstruction exists, the diuretics employed should be preceded or accompanied by mild mercurials, taraxacum or other cholitic remedies.

3. In cases of valvular disease of the heart, it is next to useless to endeavour to excite diuretic action by remedies intended to be excreted by the

* Op. citat. p. 286 et seq.

kidneys. The best diuretics will be found in whatever tends to diminish the congested state of the vascular system, and to moderate the action of the heart; as digitalis, colchicum, and other sedatives, with mild mercurials.

38. *New remedies.* Some few new medicines have lately been introduced to the profession which we shall briefly notice. The principal of these are the arseniate and the valerianate of quinine and bebeerine.

The *Arseniate of quinine* has been introduced by M. Bourrieres,* and is intended by him to be a substitute for arsenious acid, in cases in which that poison is exhibited as an anti-periodic.

The *Valerianate of quinine* has been tested by M. Devay† at the Hôtel-Dieu. Its virtues, as ascertained by him, are said to be considerable in those cases in which a combined sedative and tonic effect is required. It is, therefore, serviceable in low forms of fever with nervous excitability; in intermittents of bad character, and in neuralgic and hysteric complaints.

Bebeerine is a name applied to a salt extracted from the *Noctandra Rodiei*, nat. or. Lauraceæ, which has been found by Dr. Lagan‡ to possess anti-periodic properties of a high order, and is stated by him to be only half the expense of quinine. He records the experience of Dr. Watt of Demerara, and Dr. Nicholson of Madras, both of whom have exhibited it in intermittent and neuralgic diseases of various intensities, and who concur in the statement that it is certainly free from those unpleasant consequences, as headache, deafness, &c., which occasionally supervene upon the use of quinine.

We thus bring to a close our Report for the preceding six months, but in doing so we shall in the last place mention the titles of several papers and essays, which though not there alluded to, are worthy of perusal:—

On the changes in the urine effected by disease, and the tests to distinguish them. By E. I. Shearman, M.D. (*Lancet*, May 17, 1845.)

Observations on the reflex actions of paralytic limbs. By W. T. Barlow, Esq. (*Ibid.*, April 12.)

On the advantages to be derived from increased accommodation for the insane, &c. By E. Rowley, Esq. (*Provincial Medical Journal*, May 14.)

Practical observations on some of the more important points in physical diagnosis. By C. Durrant, M.D. (*Ibid.*, Dec. 1844, et seq.)
(An excellent resumé of the advanced state of the knowledge of auscultation in the present day.)

A critical analysis of the principal facts of disease. By H——. (*Ibid.*, Nov. 1844 et seq.)

Pathology of Expectoration. By Dr. Wright. (*Medical Times.*)

The structure and functions of the brain, with new views on the nature, causes, and treatment of mental diseases. By M. Pinel and Dr. Costello. (*Ibid.*, March et seq.)

Lectures on skin diseases. By Dr. Corrigan. (*Ibid.*, April et seq.)

* Bulletin des Académies, Avril 1845. † Bulletin de Thérapeutique, Nov. 1844.
‡ Edinburgh Medical and Surgical Journal, April 1845.

II.

REPORT ON THE PROGRESS OF SURGERY.

BY HENRY ANCELL, ESQ. M.R.C.S.E.

No observer can doubt that Surgery is making rapid progress. While on the one hand new operations are successively discovered for the cure of pathological lesions hitherto deemed irremediable, as the operation for the cure of strabismus, and the subcutaneous section in tenotomy: on the other hand, operations by the knife are superseded by a more rational and scientific, a less objectionable and equally successful treatment of the disease: as in the probable substitution of pressure for incision in the cure of some cases of aneurism. Again, surgical operations which proved unsuccessful and were abandoned in despair in a more infantile period of the art, are now likely to be resorted to successfully in the treatment of incurable maladies, as exemplified in the abdominal section for the extirpation of diseased ovaria. In a more strictly scientific point of view also, surgery is steadily advancing with the progress of physiology and pathology. An improved acquaintance with the phenomena of inflammation especially, derived from microscopical anatomy and micro-chemistry, is leading on to more rational views of treatment. Statistical records are daily furnishing more accurate data of the results of practice, and the innumerable facilities now afforded in all the more civilized communities for extended and multiplied observation are increasing in an incalculable ratio our stock of knowledge. So much is this the case that no individual in active practice can hope to embrace all that is in progress, and all that has been done, even within a limited period, in his own reading and investigation, a circumstance which we feel assured will render the periodical Reports of the Progress of Surgery, which are to form an essential part of this retrospect, acceptable and useful to the surgical practitioner, embracing as they are intended to do, results—and more especially practical results—in reference to etiology, diagnosis, pathology, and treatment.

1. One of the most recent works that has issued from the press on any general division of the subject of surgery, and by a surgeon, is an interesting volume by Mr. Macilwain,* on the Nature and Treatment of Tumours. Mr. Macilwain maintains it to be a pure assumption that cancer, fungus hematodes, and other malignant tumours, are incurable by the powers of nature—and an assumption, moreover, we may add, the tendency of which is the more pernicious as it perverts and discourages the labours of those who are industriously inclined. He takes a threefold view of the causes of tumours:—In the first place they are referrible to the food containing something unusual;—secondly, To the assimilating organs acting on the ingesta in some unusual manner;—and lastly, Or to both these circumstances combined. His curative intentions are therefore directed to diet, and to a regulation of the various organs which represent the different stages of assimilation. No

* Treatment of Tumours, &c. 8vo. London, 1845.

organ in the body, according to the views of this author, is more frequently in fault than the liver, and this often without any indicative symptoms. A knowledge of this fact is to be arrived at by a careful history of the patient, in order to ascertain what injurious influences the liver has been exposed to at any time, and whether ordinary influences have been so exalted as to become injurious. The influences referred to are especially—sedentary habits, and the free use of alcohol, and of greasy, fatty, and saccharine matter; substances which contain a superabundance of carbon. To regulate disordered liver he tries to diminish the quantity of carbon, except such as is contained in necessary food. A man may eat meat—Mr. Macilwain observes—without fat; butter is unnecessary; so is sugar; and in this way, without depriving the system of anything really necessary to health, the liver may be materially relieved, and this indeed is the great mode of assisting its function. The result of Mr. Macilwain's experience in the treatment of tumours is the smallest possible degree of confidence in local applications, particularly in those which are supposed to excite curative actions in the part, and might be called *positive* remedies. To the judicious management of those which act by excluding injurious agencies, or *negative* remedies, he attaches more importance.

Cancer, so long as the viscera are sound, is a curable disease; and the absorption of malignant tumours generally is under the influence of remedial treatment. Our author gives the case of a lady, aged 39, who consulted him for a tumour of the breast which had been pronounced hopeless. It was a true specimen of carcinoma—very hard, adherent to the subjacent parts, the skin tucked in at the nipple with a dark spot there, slightly abraded, painful, with a sense of drawing; the arm swollen and red in the vicinity of the tumour, and a few drops of blood issuing from the dark spot daily. Her general health was greatly deranged—probably not one function in her whole body performed healthily. The plan of treatment consisted in the use of a very plain diet, the rigid exclusion of sugar and grease of all kinds, friction to the skin, with special avoidance of any interference in the neighbourhood of the tumour. After the cessation of her scanty catamenia, a few leeches were applied to the pubes, and the medicine generally used were aloes and ipecacuanha, with now and then a dose of calomel. The case improved; the tumour became moveable, the suffering from it very trivial, and except when she transgressed in her regimen, although now and then a little uncomfortable, she was generally easy.

The patient relaxing in her obedience, an eminent physician was consulted, who allowed her to "eat what she pleased." The result was, that in a few days she was thrown into a state of most terrible suffering, for which opium was prescribed without relief; but a return to the former plan was attended with almost immediate amelioration, although she never recovered her former ease. So long as she adhered strictly to the plan, she had almost absolute immunity from pain; but she frequently tampered with impunity. She ultimately died, as the author believes from her own imprudence, in great agony. Mr. Macilwain gives other cases to illustrate the beneficial effects of regular and daily exercise, a plain diet, and the exclusion of saccharine, oleaginous, and alcoholic matters in malignant tumours. The plan of diet should be "simple, and strictly defined;" and one of his correspondents, Mr. Kingdon, remarks:—"I am now convinced that many diseases which have hitherto been considered incurable, may be cured by that close attention to the minutiæ of function which *does not permit the most insignificant portion of the frame to be overlooked.*"

As respects depositions generally which are not cancerous, Mr. Macilwain now seldom sees any in which he cannot succeed, by strict treatment; sometimes in procuring their absorption, almost always in arresting their progress; and he believes that he has succeeded in promoting the absorption of ten or twelve malignant tumours at least.

The author's observations on the progressive results of the successful treatment of tumours are thus described:—

"The first change observed is that if there have been much pain, there is a very material and marked diminution, or a total subsidence of it, without the influence of *opium or any other narcotic;* and this, too, when opium and other narcotics have been exhibited in vain. The tumour becomes loosened as to its subjacent connexions; and I have more than once seen a tucked in nipple resume the natural appearance. A change yet more important is, that the tumour which had before, perhaps, presented itself in one mass, with more or less irregularity, becomes broken into portions, so as to feel like separate depositions, intersected as it were by lines of more healthy structure. This is speedily followed by a diminution of the characteristic hardness; so that after awhile the carcinomatous character becomes entirely lost. The change progressing, the tumour becomes gradually absorbed, until nothing remains but what, if now examined for the first time, might be taken for an enlarged gland; and this gradually disappearing, the part resumes its ordinary character. Now all this has never happened without a change in some one or more important function to which the treatment has been specially directed, though this has varied in different cases according to the function which, on careful analysis, appeared to be most seriously or primarily affected. If I were called on to name any dietetic measure most general, I should say the diminution of carbon, in the interdiction of grease, sugar, and alcohol. If I were asked what one organ has most frequently appeared to take the lead, I should say the liver."

We have thus given as fair a statement of Mr. Macilwain's views as our space will admit of, because we verily believe that much suffering accrues, if not loss of life, from men holding the most eminent position as surgeons and physicians, distrusting the unquestionable powers of nature, and relinquishing the systematic and scientific treatment of what they deem hopeless diseases. Heterologous formations frequently disappear, to the surprise of the surgeon, without any obvious cause, but not without a cause. These cases establish the justice of our claims for the powers of nature. We believe our readers will regard Mr. Macilwain's views respecting the principles and the details of his treatment not merely as interesting, but as important.

2. A work has also been recently published on the *Treatment of Cancerous Tumours of the Breast without Operation*, in Paris, by S. Tanchou, in which 302 cases of cancer are collected together, as having got well after the employment of various remedies. We find this author boldly maintaining that cancer is not absolutely incurable. He gives, it is true, but three cases of amelioration, and fails to prove his position; yet the cases cited have been admitted by some of his reviewers as demonstrative that it is possible not only to ameliorate cancerous affections, but also to arrest their progress and render them stationary.

3. A work published at Paris by Dr. Jules Guyot in 1842, and reviewed in the *British and Foreign Medical Review* of January last, will doubtless call the more particular attention of surgeons to the important subject of tempera-

ture in operations and the treatment of surgical diseases.* M. Guyot infers from numerous experiments, that air, when devoid of any noxious impregnation, has, simply considered, no injurious action on living parts. It may, nevertheless, become injurious in two ways:—1. Mechanically, as by causing the lung to collapse in penetrating wounds of the chest,—by destroying the cellular attachments of the viscera in wounds of the abdomen,—and by distending or compressing organs as in emphysema. 2. As the medium of an injurious temperature, air introduced into the serous and synovial cavities occasions inflammation by its coldness: at the temperature of 36° cent. (96⅘ Fahr.), the articular, cranial, thoracic, and abdominal cavities, may be opened without danger of inflammation, in so far as the contact of the atmosphere is concerned. By the term "Incubation" as a curative process, M. Guyot implies a temperature of 36° cent. applied to the body by means of heated air. He distinguishes three species:—1. Local or circumscribed incubation adapted to amputations, wounds, &c. 2. Diffuse incubation, acting upon a considerable portion of the body, to reestablish a function, restore the equilibrium of the circulation, &c. 3. General incubation applicable to premature birth, defective development of infants, and various diseases. It may also be continued or intermittent in its application. Various kinds of apparatus are employed for the purpose. This peculiar treatment has been tried and found successful in ulcers, some of which were of an inveterate kind; and in one case of twenty-five years' standing, in a man aged 67, in a large, callous, and fistulous sore, in an immense lacerated wound of the arm. In a case of phlegmonoid erysipelas, terminating in gangrene, two days after the commencement of the treatment, the suppuration was diminished to one half, the wound was covered with granulations, and the fever had ceased. In œdema of the limbs, in phlegmonoid erysipelas, eczema, and a numerous variety of cases, it appears most essentially to influence the cure.

M. Guyot has put his method into practice in *white swelling*, and records cases which seem to indicate that it is worthy of a more extensive trial. A case of chronic rheumatism was cured in twelve days, and a case of periostitis of the tibia in eight days. A malignant or ill-conditioned ulcer of the nose, which had resisted ordinary treatment, was much benefited by incubation; and in another case a cancerous ulcer, of the worst character, also seated on the nose, this treatment modified the sore in a remarkable manner; the mammillated and tuberculated surface contracted its limits, caused the redness and pain to disappear, and predisposed the tissues to cicatrization. The arsenical paste was then applied, and the cure became complete. Thirty-two cases are detailed in which incubation was applied to the stump after various amputations, and the results, as compared with the results of amputation under ordinary treatment in the Parisian Hospitals, were very greatly in favour of the remedy, although there is some reason to doubt whether they were fairly attributable to the artificial temperature.

While on the subject of temperature in the treatment of surgical diseases, we may state that in Mr. Grantham's work, quoted in our extracts, great stress is laid upon the principle of keeping up the normal temperature, or the "vitality" of the superficial structures in inflammation of the ligamentous, tendinous, and cartilaginous parts of the body; and the book contains illustrations of the efficacy of the treatment founded on this prin-

* De l'emploi de la Chaleur dans le Traitement des Ulcères des Plaies après les Amputations et les grandes Opérations Chirurgicales, de l'Hysterie, des Maladies de la Peau, du Rheumatisme, &c. Par M. Le Dr. Jules Guyot.—Paris, 1842.

ciple. Thus, in the after treatment, on reduction of a bad dislocation of the ulna and radius, Mr. Grantham steams and foments the limb for an hour, and then applies a large hot bread-and-water poultice for several days. He observes of this case, which was cured in a few days, "That no blood was lost, nor any cold application used." The treatment was simply keeping up the action of the exhalents and absorbents, so as to remove tumefaction and extravasation without lessening the vital properties pertaining to the low organized textures, as it is the ligamentous and tendinous structures which are injured in all dislocations.

In the operations for removal of ovarian tumours, the surgeon finds it of the first importance to regulate the temperature of the atmosphere. In fact, no one who has witnessed the extent and length of time of the exposure of the abdominal viscera in many of these operations can doubt that their safety has been, to a very considerable extent, secured by attention to this circumstance, and that inattention to it would very decidedly increase their mortality. We have placed this subject thus imperfectly before our readers, convinced that surgeons in this variable and inclement climate are, in the main of their practice, much too negligent on this important point, and in the hope that the future numbers of the 'Retrospect' will have to record more favorable results in several departments of surgical practice, when it receives a greater share of attention.

4. Dr. Egan has lately published an elaborate article *On the diagnosis and treatment of syphilitic diseases*,* the substance of which he recapitulates as follows:—

"1st. I have observed the simple superficial ulcer, unattended with indurated margin or base, give rise to a papular eruption, pains resembling rheumatism, increased vascularity of the throat, generally accompanied with enlarged tonsils. In this form I have never witnessed the occurrence of rupia, nodes, or ulceration of the back of the pharynx: in this class, which were for the most part treated without mercury, constitutional symptoms occurred far more frequently, but were of a milder description than in those where the opposite plan of treatment was adopted. When topical applications fail, mercury is resorted to for the purpose of accomplishing a cure. 2dly. That strong presumptive evidence has been afforded, that the matter of gonorrhœa, in its incipient stage, is capable of producing a mild form of secondary symptoms; but not having been able to substantiate this opinion by the process of inoculation, I cannot, as far as my experience goes, lay it down as an ascertained fact. 3dly. That the excavated ulcer, with indurated margins and base, commonly described as the Hunterian chancre, has, in my limited number of cases, been succeeded by a scaly eruption and excavated ulcers of the tonsils; and that in those cases alone mercury deserves the name of a specific. 4thly. That the phagedenic ulcer, where it has existed *ab initio*, does not owe its characters to any peculiarity of constitution, but to a specific virus, as is evinced in the dissimilarity and inveteracy of the secondary and tertiary symptoms; and that in such cases mercury is decidedly injurious. And, lastly, that all the secondary forms of syphilis, with the exception of iritis, are curable without the aid of mercury; the cure, however, is much more protracted, but relapses far less frequent."

5. There is nothing before us of very great importance in *Thoracic Surgery*. Forty cases of injuries of the chest were the whole number received

* The Dublin Journal of Medical Science, May 1845, p. 198.

into Guy's Hospital from January 1, 1843, to December 31, 1844. The series excludes injuries in this region of minor importance treated out of the hospital. Of the 40 cases four terminated fatally, that is to say, 10 per cent. The cases include, simple injuries of the chest; fractures of the ribs, sternum, and clavicle; comminuted fractures; penetrating wounds of the chest; injuries of the lungs; with different complications, as pneumonia, pleuritis, pleuro-pneumonia, emphysema, hemoptysis, collapse, and general obscure inflammatory and other symptoms. The usually admitted principles of treatment were resorted to, as—rest, bandaging, bleeding—general and local, and purgatives; and to meet special complications and symptoms—calomel and opium, incisions, punctures, brandy and other stimulants, blisters, antimony, diaphoretics, &c. Except that a series of such cases must present novelties in their details, and if faithfully recorded, must be interesting and instructive to the surgical practitioner, this report does not contain anything new in principle, either as respects diagnosis or treatment.

6. The following is an interesting case of injury of the chest, with hernia of the right lung.* A child, 13 years old, fell from a considerable height, whilst he was playing, and struck himself against the end of a branch of a tree which had been recently cut. A wound about three inches in length on the anterior part of the right side of the chest was the consequence, extending transversely between the fifth and sixth rib. Dr. Anglo, who was called in immediately, found a considerable quantity of blood from the interior of the chest, and at the same time an elastic tumour about the size of the fist, and of a rosaceous colour, having a transverse wound, and evidently being part of the inferior lobe of the lung. There was much oppression and anxiety, an extreme pallor, the pulse "miserable," the extremities cold, and every thing indicated imminent danger. The protruded portion of the lung was reduced, although with difficulty, and the edges of the wound were brought together with bandages. The patient was three days recovering from the violence of the concussion. Reaction then came on which was met by bleedings and antiphlogistics. The wound soon cicatrized, the pulse recovered its functions, and in six weeks the cure was complete. The French Journals contain several cases in which paracentesis thoracis has been performed with successful results.

7. In *Abdominal Surgery*, Ovariotomy occupies the first place. The revival of the abdominal section for the purpose of removing diseased ovaria, is an important circumstance in the history of modern surgery, and the progress of opinion respecting this important operation, both as to its propriety as a mode of cure, and the various modifications which may be suggested in the manner of performing it, deserve the immediate and most serious attention of every practical surgeon, for, although the general treatment of the disease itself most frequently devolves upon the accoucheur, the formidable nature of the operation will in all cases render it desirable that it should be undertaken by the practical surgeon. We propose to fix the attention of our readers upon the state of our knowledge at the epoch from which this "Retrospect" dates, by referring to Mr. Phillips's paper on the subject.†

This gentleman has collected the results of 81 operations:—

The tumour was extracted in . . .	61 cases
Adhesions, &c. prevented its extraction in .	15
No tumour was found in . . .	5=81

* La Lancette Française, Avril 1, 1845. † Medico-Chirurgical Transactions, vol. 27, p. 486.

Of the whole number:—

The recoveries after abdominal section were	49
The deaths	32=81

But all the cases in which no tumour was discovered, and the operation was not completed, recovered.

Of the cases in which the tumour was extracted there were:—

Recoveries	35
Deaths	26=61

Of those in which adhesions and other circumstances prevented the removal of the tumour, nine recovered, and six died.

The large incision was resorted to in 55 cases with the following results:—

Cured	23
Recovered	6
Died	26=55

The small incision in 27, of which there were:—

Cured	13
Recovered	7
Died	7=27

Several years ago, that distinguished physiologist and practitioner, Dr. Blundell, drew up a paper which was read to the Medico-Chirurgical Society, the object of which was to demonstrate what the author then believed to be a fact, that the fears entertained by surgeons were greatly exaggerated respecting the dangers that attend wounds of the peritoneum. We have not seen the paper, but have had opportunities of conversing with its author upon the subject, and we understand that it embraced cases of most extensive laceration of the parietes of the abdomen, with extrusion of the viscera, which had ultimately recovered. The Society declined publishing the paper, but the author has never had reason to alter his own deductions from a consideration of those cases. The recent results of the abdominal section tend very greatly to confirm his views. It is quite true that in many cases of ovarian disease, previous to the period at which an operation is likely to be performed, the whole peritoneum has assumed a pathological condition; but it is equally true that inflammation, and all its consequences, is liable to occur at any period during the progress of ovarian disease, and also, that it is inflammation which is chiefly dreaded by the surgeon, in making extensive incisions through the peritoneum, and in handling and exposing the abdominal viscera. It is not for us to encourage or discourage any particular *methodus medendi*, we are rather the chroniclers of events; and we shall in future collect all the cases which meet the public eye, wherein this operation is resorted to, with a view to place the results before our readers. It may, however, as we conceive, be justly remarked, that according to the evidence before us, the danger of inflammation in these cases, is not so great as we have been taught to believe, and the observation of Dr. Blundell upon this head is perfectly correct.

An additional case is recorded by Dr. Bowles, of Harrison county, Ohio, wherein the incision was nine inches along the linea alba; the omentum was found to be adherent to the tumour, and the latter firmly bound down by adhesions to the bladder and uterus; but all the adhesions were easily separated by the handle of the scalpel. The patient vomited during the operation, producing protrusion of the intestines. To prevent distension of the bowels by flatus, a tube was kept in the rectum. The tumour

was solid, and weighed five pounds. No doubt remained of ultimate recovery.*

Cases by Mr. Clay, Mr. Lane (unpublished), and others, since the above record in the *Medico-Chirurgical Transactions*, have come to our knowledge; they are for the most part successful, and will be placed before our readers in our next number.

8. The proposed revival of the treatment of fistula in ano by ligature, according to an improved method, has met with objections. It is asserted to be inapplicable and insufficient in many cases, and also more painful and hazardous than the operation with the knife. Mr. Salmon, after nearly twenty years' experience, denies that the operation by incision is attended by any peculiar hazard from hemorrhage or otherwise. In 248 cases, selected promiscuously, he states that no fatal hemorrhage occurred; in 20 instances only, was there any bleeding which required attention, and in these cases, the simplest precaution sufficed to prevent any serious inconvenience. The operation by ligature has, again, been admitted to be applicable in cases of small and single sinuses, but its propriety doubted where large abscesses, with loss of substance, and complicated sinuses tending in different directions, occur. In these latter cases, Mr. Luke† admits that ligature offers no better prospect of success than the knife, but, he states, "certainly not less." (69) The probability of success must depend much upon the extent and direction of the communicating sinuses, and upon their complications with ligamentous and osseous structures. In more remediable cases, Mr. Luke remarks, that although, when mismanaged, the ligature may produce protracted pain, yet, when well managed, it neither produces as much pain as the knife, nor as much hazard; particularly where the rectal aperture is barely within reach of the finger. The insertion of the ligature according to the plan recommended, causes scarcely more pain than a common examination; it is at no time necessary to draw it so tight as to cause pain; "during the first few days, or until the slight inflammation of the fistula which succeeds its introduction has attained its maximum amount," it should be left loose; it is then made nearly tense, but not to give pain, and the tension is to be kept at this point by renewed turns of the screw every two or three days. The whole proceeding is to be slowly conducted, and in this consists the essence of the improvement as compared with the mode of applying the ligature in former days. When pain occurs, it usually arises on the accession of inflammation, causing the included parts to swell; the ligature is then to be loosened, which is readily effected by the kind of apparatus employed. We may add, that the operation by the knife is one greatly dreaded in most cases by patients, and frequently deferred in consequence of that dread; and there can be no doubt, that if the surgeon can conscientiously resort, as a general principle, to the treatment by ligature, the subject of this formidable disease will more readily confide in the scientific surgeon, and less frequently fall into the hands of the charlatan. (69)

9. One of the most important surgical subjects which has lately been brought before the consideration of the profession is *the cure of aneurism by pressure*. Several cases of this formidable disease, cured without operation, are quoted in our extracts, and it is most important that the practical surgeon should be made fully aware of the recent results of experience in this method of treatment. Compression effected in various ways has repeatedly been resorted to, for the purpose of arresting or curing aneurism, but we believe that we may state, at once and unequivocally, that the appli-

* Medical Times, May 3, 1845.

† Lancet, Feb. 10, 1845.

cation of pressure upon strictly scientific principles, has never had a fair trial. The cases before us justify the opinion that in many cases it will prove an adequate remedy, and will supersede the use of the ligature.

It may be useful to take a cursory view of the objects for which compression has been resorted to in the treatment of aneurism.

Dr. W. Hunter held that when the integuments begin to give way in aneurisms of the aorta, a bandage judiciously applied might preserve life for some considerable time, but looking to the effects of pressure on the arterial tunics, during the gradual dilatation of the aneurismal sac, where it meets with the resistance of the osseous structure, as of the sternum or vertebræ, he came to the conclusion, that in the main, compression or tight bandaging would only aggravate the evil. Dr. D. Munro taught the same doctrine. But in the case of false aneurisms, when small, particularly those occurring in the arm from bleeding, Dr. Munro advocates, together with moderate depletion, compression on the part, by means of compresses and bandages, to prevent the blood from flowing into the cyst; the compression to be continued not only till the tumour disappears, but likewise for some time after, lest a relapse should occur; quoting cases which have been cured, but concluding with the remark, that "where such aneurisms are large, and of long standing, this method can have no effect."* Guattani and the surgeons of Rome about this period (1750-60), attached more importance to compression as a remedy, and resorted to it somewhat more systematically in crural and popliteal aneurisms. The latter author recommends gradually compressing the aneurismal tumour, by means of bandages applied more and more tightly from day to day, and gives successful cases. It will be observed that Guattani's method was "direct and energetic"† pressure. Subsequently to the Hunterian operation being adopted, the plan of compressing the artery at some distance from the tumour was made trial of by Dubois, Astley Cooper, and others, the object being, by severe and continued pressure, to render the artery impervious. The objections to these modes of applying pressure are stated to be, and no doubt are, positive. It is either insufficient, or it is impossible to protect the neighbouring parts from its influence, and accordingly the flow of blood in the collateral vessels is arrested; it requires to be continued for a great length of time, and is attended with great pain. Hence constitutional disturbance followed by inflammation, ulceration, or sloughing of the compressed parts; in numerous cases the patient has been unable to sustain it, and from other causes it has proved unsuccessful.

We will furnish our readers with a short account of the more scientific application of pressure for the cure of aneurism, lately adopted by Hutton, Cusack, Bellingham, Allen, Greatrex, and Liston, from Professor Miller's *Principles of Surgery*. The pressure is made at the Hunterian site, but is neither constant nor severe. By any suitable apparatus, a moderate degree of pressure is applied to the vessel, at a point where the coats may be expected to be sound, and consequently not prone to ulcerate from various causes.

This is maintained so long as it can be conveniently borne by the patient, but no longer. When uneasy sensations become intense, with swelling and numbness of the limb, and throbbing in the part, the pressure is either slackened or removed. After a time, the parts having recovered, it is re-applied. Again it is removed, and thus the disasters formerly attendant upon the treatment by pressure are avoided. At the same time that

* Observations on Aneurism by John E. Erichsen, published by the Sydenham Society, 1844.

† Miller's Surgery.

the circulation in the aneurism is moderated, the tumour begins to diminish, its pulsation is less, and it feels harder and less compressible; ultimately pulsation wholly disappears, and induration becomes complete, absorption advances, and the cure is obtained with or without a pervious state of the vessel. Throughout the treatment absolute repose and decumbency are maintained, with an antiphlogistic regimen. Also, the limb below the compressed point must be uniformly and equally supported by bandaging, lest passive congestion and œdema supervene; and this pressure may, from time to time, be somewhat increased on that part of the limb which includes the aneurismal tumour. The process is one of weeks not days—gradual not sudden—interrupted, not continuously progressive. The pressure requires to be neither great nor constant, for we do not desire obliteration even temporary. It is sufficient to moderate, not essential to obstruct the flow of blood. The treatment is conducted rather as if itself were not the agent of cure, but only the means whereby the spontaneous cure may be originated and favoured.

The objections still advanced by Professor Miller to this improved method of applying pressure are:—The protracted period and ultimate uncertainty of the cure. If improperly conducted, it is in every point of view inferior to the ligature. It is less capable of general application, since many systems cannot tolerate pressure; our experience of its use is in its infancy.

The last objection of Professor Miller is exactly that which will render it incumbent on us, in the future numbers of the 'Retrospect' to place before our readers an abstract of all the cases, whether successful or unsuccessful, that may for some time to come meet the public eye. This is the only way by which profit can be made to accrue to the great body of surgeons by the experience of individuals. At present it will suffice to say that in 1831 Assalini published a case of popliteal aneurism cured by pressure. In November last Dr. Hutton, of Dublin, recorded seven cases treated by pressure, one only of which was unsuccessful. Giraldès in his memoir* cites fifteen cases, including those just referred to, of aneurism treated successfully by compression of the femoral artery, and he remarks that the mean duration of the treatment was 24 days, the minimum 5 days, and the maximum 90 days; and this author judiciously suggests that one circumstance which ought to plead strongly in favour of compression, and recommend it to the attention of surgeons, is the contingencies which await the operation by ligature. The ligature is not an infallible remedy; too frequently the disease returns after the operation, of which circumstance instances are cited upon the authority of Cooper, Brodie, Roux, and Lenoir; and serious accidents, as consecutive hemorrhage, wounds, and inflammation of the veins, gangrene, and death, have been the consequence. Such being the fact as relates to the treatment now resorted to by surgeons, the new plan ought at all events to be tried for the present, in every case, before resorting to the operation.

The advantages of compression over ligature are, that it is exempt from all danger; it is, so far as the evidence enables us to judge, more universally successful; it is applicable to certain cases of aneurism to which the ligature is not, and to some in which the operation by ligature would be likely to be followed by unfavorable results, as in the case of very large aneurisms which compress the collateral circulation. It is applicable in cases wherein the ligature is contraindicated from disease of the arterial system, and in cases of the "aneurismal diathesis;" also in cases of spontaneous aneurism in broken-down constitutions, in which the surgeon would perform

* Journal de Chirurgie, Mars 1845.

an operation only with the greatest reluctance; and lastly, its employment, if ever it should happen to be unsuccessful, does not preclude the subsequent operation by ligature.

We conclude this article with a quotation from Dr. Bellingham's explanation of the mode of applying the pressure.*

"Instead of employing a single instrument, we employ two or three, if necessary; these are placed upon the artery leading to the aneurismal sac, and when the pressure of one becomes painful it is relaxed, the other having been previously tightened; and by thus altering the pressure, we can keep up continued compression for any length of time." . . .

The instrument "consists of an arc of steel covered with leather, at one extremity of which is an oblong, padded splint; the other extremity terminates in a nut, containing a quick screw, to which a pad, similar to that of the tourniquet, is attached. . . . . The principle is extremely simple; so much so, that the patient can regulate its application himself, and it can be made of every size, so as to compress any vessel within the reach of compression." (78-9.)

10. The subject of tracheotomy and the removal of foreign bodies from the larynx excited great interest at the period when Mr. Brunel's case was before the public. In that remarkable case the patient suggested the idea of inverting the body so as to give the same facility to the passage of the substance out of the tube which it had to get in, but the experiment demonstrated that the human system is not a mere machine—a vital spasmodic action closed the glottis and rendered the experiment unsuccessful, until the art of the surgeon was resorted to for the performance of tracheotomy. A case, however, has been recorded in the *Northern Journal of Medicine* from which it appears that the idea of the mechanician will sometimes succeed, and that the knife of the surgeon may be superseded. A shilling slipped through the glottis of an individual, giving rise to comparatively little inconvenience. It seemed to the patient to be fixed at the cricoid cartilage, and that it would return if he were placed on his head:—

"The man was placed with his shoulders against the raised end of a pretty high sofa, and then being seized by three of the most powerful of those present by the loins and thighs, he was rapidly inverted, so as to bring the head into the dependent position, and after a shake or two, Dr. Simpson at the same time moving the larynx rapidly from side to side, the shilling passed into the mouth and fell upon the floor." The relief was instantaneous and complete.

In our own immediate neighbourhood a piece of cotton wool passed into the trachea of a lady from a carious tooth, a medical man was called in, and precipitately ran out for another surgeon to perform tracheotomy. In the interval, the husband believing that his wife was at the point of death, inverted her body, the foreign substance was expelled, and before the return of the doctors she was perfectly restored. It should not be forgotten, however, that the foreign substance in falling from the trachea might fix itself in the glottis and cause almost instant death, so that the inversion of the body cannot be considered a safe measure unless the surgeon is at hand with his scalpel.

11. The various foreign and domestic journals during the last six months contain the usual amount of information in the shape of lectures, essays, discussions, cases, &c.; but we believe we have extracted the most important novelties. There are some interesting instances of those cases which involve what are usually styled the minor operations of surgery, which are

* Dublin Journal, May 1, 1845.

by no means undeserving attention. The following is an instance in point:—A lady from the country had a carious tooth filed to admit a pivot to an artificial tooth. This trifling operation, which was attended with little pain, was followed by an abscess in the jaw, for which the extraction of the root was recommended; but as it was a superior canine tooth, with a deep root, and as the stump presented no hold, the most skilful dentists would not undertake the extraction. According to the advice of M. Récamier, M. Maisonneuve made an incision in the mucous membrane; and after exposing the maxillary bone, he divided the bone along the alveola. This operation is infinitely less painful than those resorted to by dentists with their various instruments. The root being thus exposed, M. Maisonneuve laid hold of it with a hook, and it was removed with great ease.*

12. Operations, novel in character, or remarkable for their boldness, are sometimes resorted to *once* even by judicious surgeons, and are justifiable, although judging from results we may arrive at the conclusion that they ought never to be repeated. These and the more rash experiments of the ignorant or reckless, like rare and extraordinary cases, frequently throw light upon the phenomena of nature, or serve as beacons for the future. Instances of one or more of these different classes of surgical cases will be found in that part of our volumes set apart for "extracts," and we may add to those contained in our present volume two cases of "Puncture of the intestines to relieve the agony of distension in supposed internal strangulation," lately recorded by Sir George Lefevre.†

"The lady of an officer of high rank had been suffering for some time with disordered digestion, when she was suddenly seized with violent vomiting and purging, and fecal matter was discharged by mouth. To this succeeded constipation and tympanitis; the latter being so distressing that it was resolved to puncture the bowels. Large quantities of gas escaped; the patient felt immediately relieved from her extreme sufferings. She died the same day or the following."

"A lady, the mother of six children, was in the family way of the seventh, and in about the fourth or fifth month of utero-gestation. She had for years been in the habit of neglecting her bowels, and retaining her fæces for five or six days, and even longer, with impunity. She complained of sudden pains in the bowels, which she took to be colicky, and used some domestic medicine. The pains increasing, and the bowels continuing locked, blood was taken from the arm, and leeches applied very freely to the part. No relief was afforded. The abdomen became very tense, and the pains returned at repeated intervals. She expressed herself thus, that she had borne six children, and that the united pains of all her labours were not so excruciating as any one of the pains under which she suffered. All means had failed in procuring her relief. Six or seven medical men were in constant attendance upon her. Injections, warm baths, cold affusions, bleeding, opium in large doses, nothing relieved her.

"It was, therefore, upon the idea only of shortening her sufferings, that it was proposed to puncture the intestines. A trocar was thrust into the colon, some gas escaped, and she exclaimed, 'I can breathe now.' Fæces soon filled up the canula; the spasms returned, but in rather diminished force. She sank in about fourteen hours after the operation, suffering to the last."

* La Lancette Française, March 29th, 1845.

† An Apology for the Nerves. By Sir George Lefevre, 1844.

III.

REPORT ON THE PROGRESS OF MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN.

BY THE EDITOR.

We shall arrange the contents of this Report under the following heads:—1. Diseases of females unconnected with pregnancy. 2. Diseases of pregnacy, labour, and the puerperal state. 3. Diseases of children.

§ I.—*Diseases of Women unconnected with Pregnancy and the puerperal state.*

1. *Amenorrhœa.* The disorders connected with the important function of menstruation never fail to command a considerable share of attention. The different aspects which deficiency of this excretion may assume, are well described by Mr. Bell, in a paper published in a recent number of the *Edinburgh Medical and Surgical Journal.** In reference to the modus operandi of emmenagogue medicines, this author observes that much less assistance has been derived from the more correct physiological notions respecting the function of menstruation which have been established during the last few years, than might reasonably have been expected; in fact, that the theory of the periodic maturation and expulsion of ova so far from rendering the action of medicines more intelligible, has tended rather to the greater obscurity of the subject. We cannot, however, admit that the explanation of the action of these medicines as derived from their operation upon the blood, is at all less applicable under our improved physiological knowledge, than it had previously been; for it is just as easy to conceive that a due constitution of that fluid is necessary to the perfect maturation of an ovum, as to the healthy formation of the bile. We do not mean to assert that there is any close resemblance between the production of ova and the secretion of bile, but merely that as both constitute the essential function of the ovarium and the liver respectively, a healthy state of the blood is as necessary in the one case as in the other, and the action of medicines, therefore, equally intelligible.

The comparative power of the different preparations of iron in restoring the blood in chlorotic patients to its normal state, is noticed by MM. Raciborski and Selade; by the latter in an elaborate paper on the therapeutic value of the ferruginous preparations in general. M. Raciborski agrees with MM. Quevenne and Miquelard in giving the preference to metallic iron in an extremely minute state of division, the mode of obtaining which will be found in a former part of this work. (100) The memoir of M. Selade† is very complete of its kind, and enters minutely

* April 1845, p. 341. † Archives de la Médecine Belge, Fev. 1845.

into the value of each individual preparation of iron. The best of these, according to this author, are the proto-muriate or hydrochlorate, the carbonate and the lactate; into which latter it is believed by Gelis and Contè, that the other preparations are converted by the action of the gastric juice. This opinion, however, is denied by M. Selade, who leans to the assumption that the metal enters into combination with the free muriatic acid of the stomach. The question is one of too purely a chemical nature for this report, and we therefore shall pass on to something of a more practical nature. We may, however, before dismissing the subject, briefly allude to the author's theory of the mode in which the iron combines with the blood. When, according to his theory, a preparation of iron becomes absorbed, it is quickly decomposed, and its ferruginous portion combines with the globules which have lost their hæmatosin, and which in this condition are found in company with great numbers of colourless globules. If it has already been oxydized, it soon becomes converted into the carbonate of the protoxide by uniting with the carbonic acid of the venous blood. When these globules arrive at the lungs, they absorb oxygen from the atmosphere, and the iron passes at once to the state of peroxide, the carbonic acid being given off.

Although chlorosis and amenorrhœa are not necessarily connected, we cannot do better than here allude to the description by M. Ricord,* of a form of Chlorosis depending upon syphilitic contamination. It has been ascertained that the action of the syphilitic poison is principally exercised upon the globules, in the number of which it causes a considerable diminution, for which reason ferruginous preparations are in general in these cases of great efficacy. They are not, however, as has been observed by M. Ricord sufficient by themselves as in simple chlorosis, but require at the same time a special antisyphilitic medication. M. Ricord therefore employs mercurials as well as iron, but we may remark that no combination is more likely to be of use in these cases than a combination of the latter metal with iodine.

2. *Menorrhagia.* In the treatment of profuse menstruation, the oxide of silver is very highly spoken of by Sir James Eyre in a useful little work lately published.† According to the author's experience, it is superior to the secale cornutum, gallic acid, and indeed all other remedies. The dose is half a grain three times a day gradually increased to one or two grains. A new, and according to M. Givestet,‡ very active medicine in the same disease is the expressed juice of the *urtica urens.* Our own experience in the treatment of menorrhagia is greatly in favour of the ergot of rye, which we give in the dose of 10 grains of the powder with 6 grains of the pulv. ipecac. c. We have seldom met with a case unconnected with organic disease of the uterus which has not yielded speedily to this combination; and we may state moreover that having been in the habit of giving it for five or six years, we have never met with any symptom whatever to lead us to apprehend the least inconvenience from its employment.

We may likewise observe that the active principle of the secale called ergotin has been productive of the greatest benefit in the uterine hemorrhages depending upon malignant disease. Dr. Ebers,§ who has had extensive experience of the medicine, recommends the following formula when

* Journal des Connaissances Médicales, Nov. 1844.

† Practical Remarks on some Exhausting Diseases. London, 12mo. 1845.

‡ Encyclographie Médicale de M. Lartigue. Oct. 1844.

§ Casper's Wochenschrift, No. 28, 1844.

the ergotin cannot be procured. Bruised ergot 100 grammes, boiling water 500 grammes, macerate for three hours and strain; then add 5 grammes of fresh lemon juice.

3. *Vicarious menstruation.* Three cases of this rare, though sufficiently familiar occurrence, have been lately recorded. The first* is that of a female who having received a lacerated wound near the elbow, had from it a supplementary periodic discharge for several months in succession. Upon her becoming pregnant the wound partially cicatrized, but the scab fell off subsequently to her delivery, again giving issue to a periodic discharge of blood, which continued until the menstrual function became thoroughly re-established. The second instance is reported in the *New York Journal of Medicine.* The third was brought before the Société d'Emulation of Paris by M. Forget.† The supplementary discharge in this case was from the conjunctiva, auditory passages, and from certain portions of the integuments.

4. *Diseases of the Ovaria—Acute Ovaritis.* The occurrence of acute inflammation of the ovaries, independently of the puerperal state, is generally thought to be unfrequent, so much so that it appears to be treated of in systematic works on the Diseases of Females, rather because its omission would leave a hiatus in the nosological code than from any distinct conception in the minds of the authors of its existence as a separate disease. There is little doubt, however, that these organs are liable to attacks of inflammation in the virgin state; and it is probable that, if the diagnosis could be rendered less complicated, it would be found to be a commoner cause of many of the symptoms attendant upon dysmenorrhœa, and other sexual affections in females than is generally suspected. The subject has lately been illustrated in an elaborate memoir by M. Chereau,‡ which has since been published in a separate form. The author acknowledges three conditions under which acute ovaritis may develop itself; first, and by far the most frequent, the puerperal state; secondly, immediately before and after the menstrual period; and thirdly, from extension of disease from neighbouring parts, as the rectum, uterus, &c. The disease may terminate in resolution, induration, softening, suppuration, and gangrene, the former being, under appropriate treatment, the most usual event. The inflamed ovary may occasionally be perceived by palpitation of the abdominal walls, but more frequently, unless greatly enlarged, it cannot be so recognised. A surer diagnosis may be formed either by vaginal examination, or by an examination per rectum, which latter is the most certain, as we are able by that means to make direct pressure upon the diseased organ. M. Chereau in the enumeration of the symptoms omits one which we have always found to be present in well-marked cases of the disease, viz. pain upon the passage of hardened fæces. We have several times found patients labouring under dysmenorrhœa and sudden suppression of the menses, in which cases we believe that the ovaries are often inflamed, who have complained of a great aggravation of their sufferings whenever the bowels have been allowed to become costive. The treatment recommended by the author does not need particular mention. (102)

5. *Ovarian Tumour.* The subject of ovarian diseases of a chronic character have lately been invested with a peculiar interest, from the attempt that has been made to revive the operation of gastrotomy for their removal. We do not regret that we have no case to record of this operation which has

* Neue Zeitschrift für Geburtskunde. † Bulletin des Académies, Oct. 1844, p. 12.
‡ Mémoire pour servir à l'étude des Maladies des Ovaries. Paris, 1845.

occurred during the period embraced by our report. The merits of the operation itself have however met with a considerable attention at the hands of several persons well qualified to give an opinion, among whom we may mention Mr. Liston, Dr. Ashwell, &c. and the result has been its unequivocal condemnation by the majority, as unjustifiable in any point of view in which it can be considered. The remarks of Mr. Liston may be found in the *Lancet*, Feb. 8, 1845. Dr. Ashwell, after taking a general review of the progress of ovarian tumours, thus expresses himself: "It does not appear that statistics more favorable even than we have a right to expect, will materially change the aspect of the circumstances under which the operation is to be performed. .... What would be thought of the feasibility of any other operation involving life in imminent hazard, if it were discovered that out of *sixty-seven* cases, it was from *absolute error in diagnosis incapable of completion in eighteen:* that of the remaining forty-nine, where the extirpation was effected, *sixteen died*, and *two were not cured;* so that out of the whole number *the operation failed in thirty-six, and succeeded in thirty-one*, less than one half."* (p. 647)

The editor of the *London and Edinburgh Monthly Journal* does not give a more promising view of the operation than the writer above quoted; indeed, as given by the former, the statistics of the operation place it possibly still lower in the scale of feasibility. In 89 cases collected in a tabular form in the above-named Journal, it appears that 55 recovered and 34 perished from the immediate consequences of the operation. But it appears also that in 9 cases either no tumour was found when the abdomen was laid open, or that it was unconnected with the ovary—cases which place the certainty of diagnosis in a very unfavorable light—and moreover in 14 others the operation could not be completed. Of these 23 patients 13 recovered and 10 died; so that the number of instances in which the intentions of the operator were fully carried out is reduced to 65, of which number 25 died. This, it certainly appears to us, is a mortality which, although it should not deter from operating in a disease by which life must otherwise inevitably be speedily sacrificed, should make us pause before we interfere in a malady which may be endured in many cases throughout long life without other inconvenience than that arising from the bulk of the tumour.

The last writer we shall mention by whom the operation of ovariotomy has been considered, is M. Cazeau, in a memoir on the subject presented to the Société d'Emulation of Paris, at the meeting of the 4th Dec. 1844. The opinions expressed by this author correspond in every respect with those above mentioned.†

Turning from the disheartening evidence with respect to operative measures for the cure of ovarian tumours, we refer with pleasure to a case reported by Mr. Brown,‡ in which a perfect recovery followed the use of compression combined with the exhibition of mercurials and diuretics. This

* Practical Treatise on the Diseases peculiar to Women. London, 1844.

† It is but right to state, that since the above was written, the operation of ovariotomy has been strenuously supported by Mr. Atlee (Amer. Journal of the Med. Sciences, April 1845), in some remarks appended to an account of a successful case of abdominal section for the extirpation of a fibrous tumour of the uterus. (106) The statistics of the operations, as stated by him are the most extensive of any as yet on record, amounting to 101 cases, in which 38 died, or 1 in $2\frac{2}{3}$. The causes of death in the fatal cases are from hemorrhage in 8, peritonitis in 8, exhaustion in 2, inflammation of large intestines in 1, gangrene 2, peritonitis and gangrene 1, causes not stated 16, total 38.

‡ Lancet, April 5, 1842.

case, as Mr. Brown very justly observes, should encourage us to greater energy in the medical treatment of these diseases.

A case related by Mr. Hardy in the same journal, in which a large ovarian tumour, having twice impeded delivery, ultimately caused death by inducing strangulation of the intestine, and another by Dr. Lambrecht, in which the contents of an ovarian cyst were on two separate occasions discharged through the umbilicus.*

6. *Diseases of the Uterus. Inflammation of the os and cervix:*—Dr. Bennett† has drawn our attention to this subject in an admirable series of papers published in the *Lancet*. He establishes a distinction between inflammation of the cervix as it occurs in the virgin, and the same disease in women who have been and are exposed to sexual intercourse. In the latter individuals, he believes that a confirmed leucorrheal discharge rarely exists without the presence of inflammatory engorgement of the uterine neck. A considerable difference is also found, according to the author, in the readiness with which the deeper structures become involved, between those women who have, and those who have not submitted to intercourse. In the latter, the deep uterine tissue is seldom involved, and the womb retains its natural resistance to the finger upon examination. On the other hand, in women who have conceived, the diseased action readily extends to the central textures of the cervix, inducing induration of the part, together with an enlarged and fissured state of the os uteri. Syphilitic ulcerations of the os and cervix uteri are exceedingly rare, as is observed both by Dr. Bennett and also by Dr. Heming,‡ but other ulcerations, both in women in whom no venereal affection can be suspected, and in those who are labouring under the indubitable secondary effects of the disease, are as common. These ulcerations are in nearly all cases, according to Dr. Bennett, simply inflammatory.

The treatment of the non-ulcerated inflammation of the neck of the womb, as laid down by Dr. Bennett, is exceedingly simple, and consists chiefly of emollient or astringent injections. With reference to this expedient, he gives us a practical hint which is worthy of remembrance, to the effect that the injection should be used by the patient lying on her back, with the pelvis somewhat raised; by which means the injected fluid is more readily applied to the diseased parts. It very commonly happens, when the injection is used in the sitting posture, that it never reaches the upper part of the vagina at all. When ulceration has taken place, cauterization either by the nitrate of silver or by the acid nitrate of mercury, speedily effects a cure. The treatment of ulceration with induration of the cervix, is not so simple. It is thus stated by Dr. Bennett:—"In these cases, cauterization may in general be resorted to at once, but if speedy benefit does not ensue, the repeated application of leeches to the uterus itself is to be advised." Of the latter proceeding he speaks in the highest terms, as a means of all others the most potent in removing the engorged and indurated condition of the parts. If this plan does not succeed, we may then try what can be done by deep cauterization with the Vienna paste, or by inunction with iodine ointment. For rules, by which the application of the caustic is to be regulated, we refer the reader to the original paper.

The subject of ulceration of the cervix uteri is likewise treated of in the *Annales de Thérapeutique*, Avril 1845, (103), and by M. Peraire, in the *Gazette Médicale*, No. 7. This author agrees with Dr. Bennett in the

* Medicinische Zeitung, No. 30, 1844.

† Lancet, May 3 and 10, 1845.

‡ Lancet, Nov. 9, 1844.

great serviceability of cauterization in the complaint, and writes for the purpose of recommending the performance of the operation "coup sur coup," that is, at short intervals. The duration of this mode of treatment, necessary for the cure of the different forms of ulceration, is thus stated: in simple ulceration, 16 or 17 days; in the granular ulcer, from 25 to 40 days; in ulcerations combined with induration of the cervix, from 4 to 5 months.

The profession is much indebted to Dr. Bennett for the perspicuity with which he has treated the subject of uterine ulcerations; a department of pathology too much neglected in this country. If his remarks, which we are glad to see are about to appear in a separate form, induce the British practitioner to inquire more deeply than he is accustomed to do into the causes of uterine symptoms in the unimpregnated state, and to treat them less by guess work, he will be the means of conferring no slight benefit upon the community; for we are convinced that these undiscovered, because unlooked for, affections of the female reproductive organs, are the cause of more moral and physical disturbance, than those to which any other part of the human frame is subject.

7. *Amputation of the cervix uteri* has lately been performed by Dr. Montgomery,* for cauliflower excrescence. The operation was performed by ligature, which Dr. Montgomery considers preferable in all cases to the knife, as even where it fails to effect a cure, it is productive of much advantage, by moderating those wasting discharges which mainly contribute to the fatal termination of the disease.

8. *Extirpation of the uterus.* Two cases in which the entire uterus has been successfully removed by ligature, for inversion, are related by Dr. M'Clintock,† and the operation by incision has been unsuccessfully performed by M. Mollet,‡ for supposed inversion. In the latter case, however, the examination proved that the diagnosis had been erroneous, as the supposed inverted uterus was nothing more than an enormous polypus, which had dragged the womb out of its situation. Some excellent remarks on the diagnosis of inverted uterus and polypus, will be found appended to the notice of the memoir of M. Mollet, in the *Edinburgh Monthly Journal*, for which we refer to the Abstract. (104) It is generally admitted, that in ordinary cases, the distinction between these two affections can be made out with tolerable certainty; the possibility of encircling the neck of the tumour in the one case, and its uninterrupted continuation with the vaginal walls in the other, being sufficient to enable us to avoid error; but, as the Editor of the journal from which the notice of this memoir is taken justly observes, when the polypus springs from the edge of the os uteri, this valuable sign is rendered useless; for we cannot in this case trace the peduncle of the polypus encircled by the os uteri, and even if we are able to feel a portion of it, it is so altered in form and situation, as with difficulty to be recognized. The diagnosis in these cases is, as the Editor states, rendered more easy by the introduction of the uterine sound, upon the plan proposed by Dr. Simpson, by which means we can ascertain the presence of the uterine cavity, and consequently form an idea of its shape and situation. M. Lisfranc recommends, in doubtful cases, the introduction of a curved catheter into the bladder, with the concavity downwards; if the case is one of inversion, the point of the instrument will be readily felt by the finger passed

* Dublin Journal, Jan. 1845.
† Dublin Journal, March 1845.
‡ Edinburgh Monthly Journal, April 1845.

into the vagina. The same surgeon, however, places more confidence in an examination per anum, than in any other. If the uterus be inverted, a void will be perceived in its usual situation; if the vaginal tumour be a polypus, on the contrary, the perception of a second tumour will announce that the uterus occupies its usual situation.

9. *Prolapsus uteri.* Professor Chaumet,* of Bourdeaux, has suggested a new method of cure in displacements of the womb, which appears to be, for the most part, a modification only of that formerly recommended by Marshall Hall. This, as may be remembered, consists in removing a portion of the vaginal mucous membrane, and uniting the edges of the incision by suture. M. Chaumet likewise makes this proceeding the initiatory part of his operation, but in addition excises a portion or the whole of the cervix uteri. There is nothing in this operation which can render it in any way preferable to that upon which it is suggested as an improvement; on the contrary, the great success by which the latter has been followed in the hands of Velpeau, Dieffenbach, Fricke, and other continental surgeons, as well as in this country under Drs. Hall, Heming, and Ireland, would tend, in our opinion, to stamp the modification proposed by M. Chaumet as a proceeding of the most unjustifiable severity.

10. *Diseases of the vagina:—Vesico-vaginal fistula.* This afflicting accident has lately been made the subject of a lengthened discussion at the Académie des Sciences Médicales (Séances, Fev. et Mai, 1845) on the presentation of a memoir by M. Berard, upon an operation for its removal, which was originally recommended by Vidal de Cassis. This operation, to which the term "*infibulation*" has been applied, consists in the obliteration of the vagina, by dissecting off its mucous membrane, and bringing its walls into apposition by sutures. The objections to this extraordinary operation are sufficiently obvious; and we need only mention the retention of the menses which must ensue, to say nothing of depriving the female of the attributes of her sex, to convince our readers that it would not obtain a moment's consideration among British surgeons. Strange to say, however, the operation was defended by M. Velpeau. MM. Dubois and Moreau more justly pronounced the proceeding as irrational.

11. A case of *laceration* of the vagina during labour, with the escape of the fœtus into the abdominal cavity, is reported by Mr. Oliver,† and a second by Mr. Graus.‡ The latter is chiefly remarkable for the mode of treatment which it was thought proper to adopt in order to combat the consequences of the peritonitis which ensued, and which consisted in injecting the peritoneal sac through the rent in the vagina, and withdrawing the purulent accumulation which had taken place by means of a syringe and an œsophagus tube. The patient survived this extraordinary proceeding, and moreover sustained the additional operation of an incision in the lumbar region, for the purpose of liberating the purulent matter which had accumulated in the neighbourhood of the kidneys. In the discussion which ensued upon the relation of this case, it was reasonably doubted whether the vast collection of pus was not contained in the pelvic and lumbar fascia, rather than within the cavity of the serous membrane. (115)

* Bulletin de l'Académie Royale de Médecine, reported in Medical Times, April 12th, 1845.

† Lancet, November 1844.

‡ Bulletin de l'Académie Royale de Médecine Belgique, 1844-1845, No. I, p. 3.

§ II. *Diseases of Pregnancy.—Labour.—The Puerperal State.*

12. *Pregnancy. Obstinate vomiting.* There are few practitioners who have not experienced difficulty in allaying the distressing vomiting of pregnancy; and, indeed, examples are not wanting in which the irritability of the stomach has resisted all treatment for so long a time, that the female has sunk from the exhaustion consequent upon the want of nutrition. It is in these cases that M. Chailly* has lately confirmed the safety and success of inducing premature delivery. Of the propriety of this proceeding, when milder means have failed, there can be no doubt. From the period of its first introduction by Dr. Denman, to the present time, it has been performed sufficiently often, and by men whose names are a sufficient guarantee for its rationality (Burns, Merriman, Davis, Blundell, &c.) to enable us to recognize it as one of the occasionally necessary expedients of practical midwifery.

13. *Extra-uterine fœtation.* Several additional examples of this unusual occurrence have occurred within the last few months, two of which are peculiarly interesting, from the similarity of their termination. The first of these is recorded by Mr. Hemard,† and is that of a female, æt. 38, who exhibited the principal signs of pregnancy, and among others one which is said (Rigby, *System of Midwifery*, p. 72,) to be generally absent in extra-uterine gestation, namely morning sickness. At the end of nine months the uterus assumed an expulsive action, and the decidua was thrown off; after which the female gradually recovered, and remained well for three years, when she again applied to Mr. Hemard in the last stage of marasmus, having passed one or more fœtal bones by the urethra, encrusted with calcareous matter. Upon examination after death, the bones of a fœtus were found in a cyst, which had contracted adhesion with the bladder, with which viscus it communicated by two ulcerated openings.

The second case, which is one of the same kind, is reported by Dr. Leitch.‡ In this case the woman applied with symptoms of stone in the bladder, but died before the extraction could be undertaken. The calculus was found after death to be composed of triple phosphate, having for its nucleus a fœtal tibia. The remainder of the bones were contained in a cyst, which, as in the former case, had contracted adhesion to the bladder.

The third case which we have to allude to is one of supposed fallopian pregnancy, which occurred in the practice of Mr. Waddy of Birmingham, and is published in the *Prov. Medical Journal*, April 12. The woman died with symptoms of peritonitis, but no signs of the existence of inflammation were discovered after death. The tumour in the fallopian tube was composed of hydatid cysts, and the uterus contained a five-months' fœtus, so that the case was looked upon as one of twins, the second fœtus being extra-uterine.

There are also two other cases mentioned in the *Gazette des Hôpitaux*, Mai 6, 1845; one which occurred in the practice of M. Velpeau. From the other in which, as in the case above mentioned by Dr. Leitch, the patient applied for relief from symptoms of calculus, M. Morlane of Metz removed from the bladder a scapula, humerus, lower-jaw, and a portion of one of the bones of the cranium.

14. *Uterine hydatids.* An instance of this affection which is chiefly

* Gazette Médicale, Mars 1845.

† Lancet, November 1844.

‡ Edinburgh Monthly Journal, February 1845.

valuable as affording direct proof of its connexion with impregnation, is recorded by Dr. Mitchell.* The female, as is usually the case, suffered more severely than common from the early symptoms of gestation, and was supposed at the time of examination to be about a month gone, as previously to that time her catamenia had occurred with perfect regularity. The uterus, however, enlarged with such rapidity that the opinion of natural pregnancy was rendered untenable; but the exact diagnosis was obscure, as the absence of any watery discharge, and the escape of pure blood led the attention away from the contemplation of an hydatid formation. At the expiration of about six weeks, the contents of the uterus were expelled, in the shape of an immense body of *racemose acephalocysts*. Hemorrhage and after-pains ensued as in natural labour, and the woman subsequently died of peritonitis. On examination after death, the uterus was found precisely in the condition seen a few days after natural labour, and the left ovary exhibited a perfectly developed and recent *corpus luteum*.

15. *Labour and its complications.—Distorted pelvis.* Where the diameter is less than three inches, M. Moreau† advises the attempt to stint the growth of the fœtus, by submitting the mother to a debilitating regimen. He affirms that by this plan a full-term child may be caused to be as small as one of seven months. This opinion, it may be remarked, is opposed to that of the generality of observers, and is also refuted by the fact, that the most debilitated women and even some in the last stage of phthisis, often give birth to large and plump infants.

16. *Malformation of the uterus.* The impediments which an unusual conformation of the uterus may occasion to natural labour, is shown in a singular manner in a case which is recorded by M. Lecluyse.‡ The subject of this malformation was a small female, who had previously been twice confined with an arm presentation. The occurrence of the same accident for the third time caused the accoucheur to make a minute examination, in order, if possible, to find an explanation of so unusual a circumstance. The result of the investigation was, the womb, instead of being of the natural pyriform shape, had its greatest diameter in a transverse direction; so that the long axis of the elliptic form which the fœtus occupies in utero was horizontal. This anomaly was thought by M. Lecluyse to account for the three consecutive arm presentations.

17. *Laceration of the uterus.* Two cases of complete separation of the cervix uteri during labour may be found in the periodical press of the last six months; one which presented itself to Dr. Davis§ of Newry; the other to Dr. Reardon.‖ A third and most marvellous case occurred to Dr. Morgan,¶ Penn., in which the ruptured uterus formed a fistulous communication with the lower bowel, the fæces passing per vaginam for a period of thirty days. The female recovered, and the bowels resumed their natural action.

The process of parturition is not only subject to interruption from causes dependent upon the mother, but is likewise greatly influenced by certain circumstances attendant upon the fœtus. Among the first of these which we shall allude to is

18. *Sex of the child as influencing the duration of labour.* A most

* Medical Examiner, Nov. 2, 1845.

† Practical Treatise on Midwifery. Translated by Dr. Betton. Philadelphia, 1844.

‡ Annales de la Société Médicale d'Anvers, et Journal de Chirurgie, Mars 1845.

§ Dublin Medical Press, Jan. 15. ‖ Ibid., March 19, 1845.

¶ American Journal of Medical Sciences, April 1845.

interesting and elaborate paper upon this subject has been furnished by Dr. Simpson,* in the course of which he proves by statistical data, that the danger, both to the mother and the child, is greater in the case of male births than in female. For the tables upon which this fact is established, we refer to another part of the work (109); we shall content ourselves in this place with the statement, that the author explains the circumstance upon the ascertained fact that the head of the male infant at birth is $\frac{1}{8}$ larger than that of the female. That such is the true explanation is probable from the circumstance as shown by Dr. Simpson, that in premature births, and still-born putrid children, the proportion of maternal deaths is equal for the two sexes; in the birth of a living child at term on the contrary, they are as 2 to 1.

19. *Malformations.* Among the malformations of the fœtus which may offer an impediment to parturition, the only one which offers any interest is the discovery by M. Bouchacourt† of a peculiar hydatid degeneration of the kidney caused, as he believes, by an arrest of development consequent upon the obliteration of the ureter. The author adduces a case in which this malformation had gained such dimensions, that puncture was necessary, in order to complete the labour. The same disease had been previously noticed by Rayer, and has recently been illustrated in a paper by Dr. Cormack.‡

20. *Influence of shortness of the cord on labour.* A memoir has been presented to the French Academy of Medicine, by M. Hirtz,§ of Strasbourg, which enters very fully into the consideration of this source of difficult labour. The author believes with Mauriceau and many of the older writers, that shortness of the funis, whether original, or secondary, from circumvolution, is one of the causes of impeded labour, and warrants in all cases in which it can be ascertained, the use of the forceps. This condition of the cord may be recognized, according to M. Hirtz, by the alternate descent and ascent of the head occasioned by the uterus, when it ascends after the cessation of a pain, dragging up the fœtus. M. Danyau and Capuron, who reported upon the foregoing memoir, agree with the generality of writers in refusing to admit shortness of the cord as an impediment to labour, and likewise deny the value of the symptoms laid down by M. Hirtz, rationally concluding that the ascent of the fœtal head, which is so general an occurrence in all natural labours, is due to the subsidence of the expulsive effort of the uterus and its consequent relaxation, and is totally irrespective of the length of the cord.

It may likewise be here observed that the effect of circumvolution of the cord upon the life of the child, has been investigated in an inaugural thesis by Dr. Mayer,‖ of which a notice will be found in the *British and Foreign Med. Rev.*, April 1845, p. 546. It does not appear from the statistics added by the author that the occurrence is a source of great fatality to the infant, for of 185 cases in which circumvolution was ascertained, death was attributed to that circumstance alone, only in 18; 73, however, were born in a state of asphyxia.

21. *Shoulder presentation.*—M. Walter¶ has met with an instance in

* Edinburgh Monthly Journal, Jan. 1845.

† Gazette des Hôpitaux, Fév. 1845.

‡ London and Edinburgh Monthly Journal, Jan. 1845.

§ Gazette Médicale, Mai 10, 1845.

‖ De circumvolutionibus Funiculi umbilicalis fœtus vitæ haud raro infestis, &c. Proposuit G. A. Mayer. Heidelbergiæ, 1842.

¶ Neue Zeitschrift für Geburtskunde, 1844.

which the above preternatural presentation occurred in six successive labours. The circumstance is explained by him upon the fact that the female having an extraordinary wide pelvis, the uterus would naturally take a greater lateral development than usual, which, as he observes, would cause the fœtus as in the case above related by M. Lecluyse to assume a position with its long diameter horizontal.

In connexion with the subject of preternatural presentations, we may remark that Dr. Douglas* has published a third edition of his work on *Spontaneous Evolutions*, in which, however, no new information has been added to that which his former editions have rendered familiar to the obstetrical practitioner. Of the truth of the author's explanation of the process, there can be no doubt; indeed, we may say, that it is the one now generally adopted. The only recent instance of the phenomenon is, that recorded by Dr. Sussewind, in No. 23 of *Casper's Wochenschrift*. When first seen the right upper extremity projected from the external parts; the pains being so violent that turning was impossible. Dr. Sussewind having taken some blood, the woman said that she felt the child advancing, and, in fact, the shoulder was forced beyond the vulva, the lower extremities and buttocks at the same time turning into the hollow of the sacrum. Soon the right ramus of the lower jaw came in sight, the shoulder and arm having receded. But little effort was then required to disengage the breech, upon which the child was quickly born, but dead.†

22. *Uterine hemorrhage.* The subject of hemorrhage during parturition has of late attracted considerable attention, from the proposal,—the priority of which is disputed by Professor Simpson,‡ of Edinburgh, and Dr. Radford,§ of Manchester,—to extract the placenta before the child, as a substitute for the ordinary practice of delivery by turning. We shall not stay to animadvert upon the controversy to which this proposal has given rise, but proceed at once to inquire into the merits of the operation itself. Hemorrhage from placental presentation, is, as is well known, one of the most fatal complications to which the parturient woman is subjected, the deaths being one in every three cases according to Dr. Simpson. If this be the result of treatment by the ordinary practice of turning, it cannot be controverted that there is ample room for improvement. That an improvement in this respect is really offered in the proposition to extract the placenta before the child seems to be established by the data accumulated by Dr. Simpson, the mortality being reduced from one in three to one in fourteen. It appears also that, however alarming the hemorrhage may be, it ceases immediately that the placenta is extracted; in fact, out of 111 cases, in five only did the bleeding continue so profusely as to cause apprehension. We may, therefore, taking for granted that the facts are correct, fairly assume that Dr. Simpson has established his position as regards the mother; but the maternal life, though confessedly of primary importance, is not the only consideration; we have also to take into account the effect of this innovation in practice upon the life of the child. We are not aware of the existence of statistical facts in any number by which we may judge of the amount of infantine mortality under the operation of turning, but as far as we may come to any conclusion from the results of the practice of a

* An Explanation of the real process of Spontaneous Evolution of the Fœtus. Dublin, 1844.

† Reported in American Journal of Medical Sciences, April 1845.

‡ London and Edinburgh Monthly Journal, March 1845.

§ Provincial Medical Journal, Feb., March, 1845.

single individual,* the children saved may be stated to be one in four. Now, if the placenta be extracted before the child, it must be almost inevitably at the cost of its life, for unless the uterus expels it in the space of a few minutes, it must die asphyxiated from the disruption of its connexion with the source of the oxydation of its blood—the maternal circulation. In so far then as the infant is concerned, the new practice must be looked upon as slightly inferior to the old, since it induces its almost necessary extinction. The question, however, as it appears to us, may be thus plainly stated :—Which of the two is the better, an operation which saves one child in four, assuming from want of data that is the proportion, but allows the sacrifice of one mother in three, or that by which (say) every child is lost, but by which only one mother in 14 perishes? There can be little doubt but that the smaller sacrifice of life, abstractedly considered in the latter case, taken in connexion with the higher value of the mother, justifies us in preferring the new to the ordinary practice. But this estimate of the new operation is arrived at by regarding it as inevitably fatal to the child; if, however, we reflect that in a certain proportion of cases the child will follow immediately upon the expulsion or extraction of the placenta, and thus be born alive—its destructiveness to infant life, which for argument sake we had allowed, is greatly diminished.

Among the means lately recommended for the suppression of uterine hemorrhage in general, we may mention two: galvanism as employed by Dr. Radford, and compression of the abdominal aorta by MM. Sentin,† Chailly,‡ and others. We shall not needlessly occupy our limited space by dilating upon the former expedient, but refer the reader to our abstract, in which Dr. Radford's communication will be found at length. (113) *Compression of the abdominal aorta* was first introduced by Saxtorph (*Dissertatio de Hemorrhagia partu insequenti,*) and has since been successfully practised by Baudelocque and others. Minute directions for the due maintenance of the pressure are given by M. Sentin. (114) M. Chailly prudently refuses to rely entirely upon pressure, but advises at the same time other means of undoubted efficacy, such as the ergot and the administration of cold enemata. The latter expedient is scarcely, we think, sufficiently appreciated in this country.

23. *Operative midwifery :—turning.* On this mode of extracting the fœtus, we find during the last few months remarks by Professor Simpson § and Mr. Dalton.‖ The former writer discusses the question whether it is advisable to endeavour to seize both feet, or only one. He decides, with Puzos, that the latter is the better proceeding, because we, by using traction upon one leg only, " more nearly imitate the natural oblique passage of the breech of the infant " In no case, says Dr. Simpson, should we deliver by both feet, excepting in rupture of the uterus. This opinion, it may be observed, is not in correspondence with that of the majority of accoucheurs. (Vide *La Chapelle,* p. 93, *Rigby's System of Midwifery,* p. 150, &c.)

Mr. Dalton recommends a plan of turning, where the introduction of the whole hand is impossible, which he believes to be original. It appears, however, rather to be a mode of assisting spontaneous evolution, than one of turning, properly so called. Being summoned to a case in which the arm was presenting beyond the os externum, and finding it impossible

* Vide Mr. Watson's Report of Obstetric Practice. Provincial Medical Journal, Dec. 2, 1844.

† Bulletin de l'Acad. de Méd. Belgique.

‡ Op. cit. p. 475.

§ Edinburgh Monthly Journal, February 1845.

‖ Lancet, April 12, 1845.

to gain admission into the uterine cavity, he, before having recourse to any more severe means of delivery, determined to adopt the plan which we shall give nearly in his own words:—"I passed the index and middle fingers of the right hand to the occipital protuberance of the child, and found that I could raise the head upwards, and towards the left, in which position I succeeded in maintaining it after the subsidence of the pain, by the use of the index finger of the left hand. I now pushed the head of the child still further up with the fingers of the right hand, supporting the trunk during the pains with the left; and during the remissions, thus passed successive portions of the spinal column towards the left ilium of the mother, until I caused the breech to descend, when the birth was quickly completed."

24. *Cæsarean section.* Several cases of this severe operation have been lately recorded, which we shall briefly allude to. The first is related by Dr. Prael,* and is remarkable not only for its perfect success, but from the fact that in a subsequent pregnancy, the incision was spontaneously ruptured, the child being extracted through the abdominal walls. Both mother and child recovered. Two successful cases are also to be found in a late number of the *Gazette Médicale.*† In a fourth operation performed by M. Vanhauvel,‡ the mother died, the infant was saved. A fifth proved successful in the hands of Dr. Bresciami.§

25. *The Puerperal state—Puerperal fever.* The *Provincial Journal*‖ contains several papers in which this important disease is carefully reviewed by Dr. Blackmore, who subscribes to the opinion, now very general, that it has, in its more fatal form at least, the closest analogy to typhoid erysipelas. The same view is likewise taken by Mr. Symonds,¶ to whom we are indebted for an excellent paper upon the subject, and by Mr. Storrs. Mr. Symonds, however, in acknowledging the erysipelatous nature of the epidemic fever, agrees with the general experience of the profession, that there is a form of the disease which is purely inflammatory, and which, according to him, may attack all the tissues of the uterine organs indiscriminately. The same writer speaks also of a third form which he calls remittent puerperal fever, but which appears obviously to be nothing more than *intestinal irritation* occurring in the puerperal state. Mr. Storrs, after alluding to three distinct classes of infectious or contagious diseases, which from time to time occur in the animal economy, proceeds to lay down the following important proposition:—

"That puerperal fever is capable of imparting to any person, not in the puerperal state, by actual contact, or close approximation, any of the following diseases:—1. Inflammation of the peritoneum, or other serous membranes, accompanied by a low type of fever. 2. Erysipelas, either *local*, such as occurs from dissection wounds, or *general*, as on the face or person. 3. Typhus fever with various accompaniments, and in a variety of forms."

In illustration of each of these propositions, several cases are adduced which clearly justify the author's assumptions; those under the second head are peculiarly interesting, and should afford a wholesome caution to the accoucheur both as regards his own person and the welfare of his next puerperal patient.

* Philadelphia Medical Examiner, April 1845, from Dublin Journal.
† Mai 10, 1845. ‡ Encyclographie des Sciences Méd., Mars 1845.
§ Annali Universali di Med., Dec. 1844. ‖ March, April, and May 1845.
¶ Lancet, May 17, 1845.

The treatment of puerperal fever is judiciously laid down both by Dr. Blackmore and Mr. Symonds. In the sthenic form of the disease, blood-letting is to be considered as the most important item in the treatment; but in the second, or erysipelatous form, it requires to be used with great caution. We question much, however, whether general bleeding is ever a justifiable practice in the latter case, even to the small amount of four ounces as recommended by Dr. Blackmore; we should put more faith in the extensive dry cupping alluded to by him, followed by sedulous fomentation of the abdomen. The great advantage of an early recourse to stimulants and tonics is distinctly shown in a case referred to by Mr. Symonds.

26. *Phlegmasia dolens.* M. Rostan* agrees with Dr. Lee and others, that the proximate cause of this affection is the obliteration by coagula of the femoral vein; he differs, however, from that eminent physician, in seeking an explanation of the coagulation unconnected with inflammation. He alludes to the fact ascertained by Becquerel and Rodier, that in the puerperal state the blood undergoes certain modifications, the principal of which is a diminution of the globules, with relative increase of the fibrin. In consequence of this change, the blood assumes an unnatural disposition to coagulate. The direct formation of coagula he explains by the retardation of the blood caused by the pressure of the fœtal head upon the iliac veins; that this explanation is the correct one, he thinks is rendered probable by the more frequent occurrence of the disease in the left leg.

27. *Puerperal rheumatism.* M. Piorry† has endeavoured to ascertain whether the rheumatism which he has frequently seen to attack lying-in women, has not something of a special character. The result of his inquiries seems to be, that it differs from ordinary rheumatic arthritis in the smaller frequency of cardiac complication, and in its tendency to induce suppuration in the synovial capsules.

28. *Puerperal convulsions.* An admirable paper upon this subject appeared in the *Lancet*‡ at the close of the last year, a condensed statement of which will be found in another place. (116) The chief merit of the communication consists in the lucid manner in which the doctrines of the excito-motory system are brought to bear upon the affection. The author justly criticises the opinions, that the convulsions depend upon cerebral congestion because that is the only or chief post-mortem appearance. There is, in our opinion, no more frequent error committed in the deductions derived from pathological appearances, than the one in question. It is apparently forgotten, that from the peculiar circumstances under which the brain is placed as regards atmospheric pressure, &c. that congestion of the venous system is a natural appearance, and that, if the head be opened before the thorax, this appearance is always more decided than when the case is reversed. From want of reflection upon these facts, it has frequently occurred to us to hear a state of brain pronounced to be pathological, which is the natural and inevitable consequence of the physical conditions of the organ. But to return to the subject of puerperal convulsion;—the author very properly states, that the proximate cause is not to be sought in the brain, but in the spinal marrow, and that the disease is in all cases due to irritation of that part, together with the medulla oblongata. He does not deny that the convulsions may occasionally arise from effusion of blood or vascular congestion, but as he correctly remarks, these cases are not sufficiently common to form the basis of a theory. Were it so, the fits should always

* Gazette des Hôpitaux, 3 Mai, 1845.

† Ibid. 29 Avril, 1844.

‡ Nov. 30 and Dec. 6, 1844.

arise at a time when cerebral congestion is the most pronounced, as in the second stage of labour. But this, common experience teaches us is not the fact. The only correct mode of viewing the causes of convulsion is, we fully believe, that propounded by the author, viz. that they are of two kinds, the one acting directly upon the spinal marrow, and therefore of *centric* origin, such as, congestion, anæmia from loss of blood, and emotion; the other class of *eccentric* origin, which consist in irritation of the incident fibres arising from the uterus, intestines, bladder, stomach, &c.

The same affection has also been made the subject of a communication to the Scandinavian Naturalist's Society, by Dr. Blich, of Drammen.* The results of this observer's experience in the disease is as follows:— He had witnessed it only 8 times in 396 labours. Of these three were during pregnancy, three during labour, and two immediately after the birth of the child. The mothers were all between 25 and 30 years of age, and five were primiparæ. Of the children four were born alive, three were supposed to have died during or immediately after the first convulsion, as the fœtal heart ceased to be heard at that time. It may be observed that, according to Chailly,† the mortality of the child is one fourth; La Chapelle places it as high as one half. All Dr. Blich's cases were, as is generally the case, head presentations.

29. *Lactation.* In connexion with this subject, Dr. Witt‡ remarks upon the impropriety of postponing the attempt to obtain a development of the nipple, in those cases in which it is small and buried in the breast, until nursing becomes immediately necessary. He advises, on the contrary, that the breast should be examined early in pregnancy, and that where it is necessary, the appropriate treatment should be at once commenced. The proceeding which Dr. Witt recommends for the purpose is exceedingly simple. The breast is first to be fomented until the nipple becomes turgid, when an india-rubber bottle, accurately fixed upon a box-wood nipple shield, is to be applied. The re-expansion of the compressed bottle acts in the same manner as the exhausting syringe.

30. A remarkable appearance, first described by Rokitansky as occurring in puerperal women, has lately been investigated by M. Ducrest.§ The appearance alluded to consists in a laminar exostosis, which springs from the internal table of the skull. The author is obviously unaware of the priority in discovery due to Rokitansky, and for this reason his observations are of the more value, as they correspond exactly with those of the above-named writer. It seems that the affection is most common in primiparæ, but is chiefly worthy of notice as a medical curiosity, for it has never been traced to any direct cause, neither has it any connexion with symptoms which can be considered as indicative of its presence.‖

§ III.—*Diseases of Children.*

31. *Diseases of the fœtus.* Our information with respect to the morbid affections incidental to intra-uterine existence, has not been materially advanced during the period embraced in our Report. The only notice connected

* Bibliothek für Læger. By Dr. Otto, 1844. † Op. cit.

‡ Neue Zeitschrift für Geburtskunde, E. xvii, 1 cahier.

§ Mémoires de la Société Médicale d'Observation de Paris, tom. ii.

‖ After the above was written, we have seen an elaborate microscopical notice of the affection, in the January number of Müller's *Archiv für Anatomie,* and of which we shall give an analysis in our next Volume.

with this department of pathology which we have met with, is that by M. Hamel,* on obesity of the cord; by which he means such a development of adipose tissue as to interrupt the umbilical circulation, and thus cause the death of the fœtus. This fatal accident, according to the author, is principally observed in those women who from being thin suddenly become very fat under the influence of pregnancy. The time at which the death of the child generally occurs is at about the sixth month. The practical deduction drawn by M. Hamel is, that great obesity in the mother is dangerous to the fœtus, and should be prevented by appropriate regimen.

32. *Diseases of infancy.* The diseases of infancy and childhood have been recently illustrated in two separate monographs, one by M Bouchut,† the other by Mr. Hood.‡ Both of these writers acknowledge the great difference which exists between the diseases of the child and adult, more particularly as regards the effect of antiphlogistic treatment. The special object, in fact, of the latter work, is to point out the necessity of regarding the diseases of the infantile period as depending less upon inflammation than irritation. The author strongly deprecates the common practice of flying at once to leeches and other antiphlogistic treatment, upon the slightest excitement of the circulation in childhood, without reflecting that there is scarcely a single inflammatory affection, whether of the brain, lungs, or other organ, which may not be closely simulated by irritation arising from the teeth, or the condition of the stomach and bowels. Without denying that the author may, in his anxiety to avoid one error, be in danger of too closely approaching the opposite, we most cordially record our assent to his views in the abstract; and we believe that, if they were more generally adopted, the result would be a considerable saving of infant life.

In connexion with this manner of regarding infantile diseases, we refer the reader to Article 121, which contains some important observations respecting the employment of stimulants in the pulmonary diseases of children. The question is one of great importance in practice, for there is in all cases of these affections, a time at which the further persistence in antiphlogistic treatment, however necessary it might have been at first, assuredly precipitates the fatal event. To be able, therefore, to distinguish the period at which it is not only safe but necessary to resort to a stimulating plan of treatment, must be highly desirable. In the paper alluded to, the symptoms indicating the necessity for the change are stated to be a pallid and sunken state of the countenance, with fluttering pulse, and increased frequency of respiration; but these are not in our opinion sufficiently decisive in themselves to obviate the danger of an injudicious perseverance in debilitating treatment. We are rather disposed, in accordance with the opinion expressed by Dr. West,§ in his admirable *Report on the Pneumonia of Children*, to regard stimulus as necessary in all cases in which bronchial respiration is present when the patient is first visited, or becomes so in spite of an average amount of antiphlogistic treatment; and especially when at the same time the bronchial tubes are clogged by mucous secretion. It is under these circumstances, we are aware, that many practitioners advise the persistence in the exhibition of antimony in increasing doses; but we have learned by experience, as doubtless many others have likewise, that although this plan may be safe in the adult, it is not so in

* Lancet, April 5, 1845; from the Académie de Médecine, Séance Fev. 1845.

† Traité Pratique des Maladies des Enfans, &c. Paris, 1845.

‡ Practical Observations on the Diseases most fatal to Children. London, 1845.

§ British and Foreign Medical Review, April 1843.

the child; that it is, on the contrary, apt to induce the most fatal prostration, even without the occurrence of vomiting or perceptible nausea. If we were to be guided by the results of personal observation, we should say that it is seldom safe to persevere in an unmixed antiphlogistic line of treatment in a child under three years of age, for longer than three or four days; and that, especially if bloodletting has been employed, it will be necessary by this time to resort cautiously to a stimulating regimen. (123)

33. *Diet of infants.* The proper food for an infant after weaning, and during illness, is always a source of doubtful discussion, not only among parents and nurses, but also among medical men. Dr. Stewart, in reference to this subject, condemns the practice of resorting on all occasions to a vegetable diet, as arrow-root, &c., for the simple reason that it must necessarily be assimilated with greater difficulty than animal food. He advises instead of these articles, the substitution of the jelly made from isinglass, as it is less likely to induce acidity in the primæ viæ. The suggestion is a most useful one in cases of muco-enteritis, and other diseases accompanied by an irritable state of the intestinal mucous membrane. (120)

In the department of cerebral diseases of infancy, we have nothing of importance to communicate; indeed we may say that the whole range of infantine pathology has met with but little advancement in the period embraced by our Report. We shall proceed, however, briefly to notice a few recent communications upon the diseases of other regions.

34. *Aphtha infantum.* MM. Trousseau and Delpech* have devoted a long series of papers to this disease, the substance of which we shall endeavour to reproduce. In regard to the nature of the affection, the authors, after criticising the opinions of Billard, Lebit, Guersant, and others, propound their own, which is, that the muguet, or aphthous patches, consist of a fibrinous pseudo-membrane, situated on the surface of the digestive mucous membranes, deprived [in those spots? Ed.] of its epithelium. 1. *Seat of the disease.* This may be in the mouth, pharynx, and œsophagus; occasionally, but seldom, in the stomach, small and large intestines. The opinions of MM. Valleix, Billard, &c., that the entire length of the intestinal canal may be occupied by the disease, is stated by the authors to be erroneous. 2. The *causes* are thus laid down:—These are of two kinds, the direct or local, and the general. Among the former the authors enumerate, want of cleanliness, the use of dirty spoons, teats, &c., and the ingestion of sour milk. The second class comprises the confined air of hospitals, contagion, and the puerperal diathesis. The latter, which shows itself in the mother by the occurrence of puerperal fever and phlegmasia dolens, exhibits itself in the child under the form of phlebitis of the cord, purulent ophthalmia, and aphthæ. The authors likewise observe with M. Valleix, that the appearance of aphthæ frequently complicates and adds to the danger of enteritis, but they differ from him in the value they attach to their presence; regarding them rather as a coincidence, than as necessarily connected with the disease. Aphthæ may likewise originate under the influence of certain cachexiæ. 3. *Symptoms.* Aphthæ infantum may assume two different forms, one mild, the other more severe. The first form commences with a dryness of the mouth and fauces, which is soon followed by the appearance of small granular eminences of variable colour. The mucous membrane at the same time puts on a velvety aspect, and the submucous tissues are frequently infiltrated with serum. The eminences

* Journal de Médecine de M. Beau, Jan. 1845. In Encyclographie des Sciences Médicales, Fév., Mars, 1845.

above mentioned subsequently exhibit little whitish or fawn-coloured spots, some of which, in the course of a few days, coalesce in large patches. This white appearance is caused by the fibrinous exudation. The duration of this mild form of the disease is from eight to twelve days. In the second or more dangerous form, besides the appearences just alluded to, other and more dangerous symptoms supervene. The principal of these are obstinate diarrhea, erythematous patches principally confined to the thighs, and ulceration of the mucous membrane of the mouth, and of the inner ankles. The latter symptom is apparently caused by the chafing together of the parts, and is indicative of a very severe type of the disease. 4. *Treatment.* The treatment naturally divides itself into the preventive and the curative. As the disease is evidently more rife in crowded hospitals than in other localities, one obvious precaution is, to diminish the number of beds in those establishments. Suckling is also a great preservative, and exercises an indubitable influence upon the mortality of disease. Of 51 children who were affected, 29 were nursed by the mother, 21 were not; of the former only 7 died, of the latter 17. The influence of lactation therefore is highly beneficial. The local treatment consists in the employment of the biborate of soda, and honey, in slight cases, and if this have not the desired effect, in the substitution of alum, or nitrate of silver, as a local astringent. The constitutional treatment recommended by the authors is as follows:—Ipecacuanha in emetic doses; bismuth and prepared chalk, or small doses of calomel, and carbonate of magnesia. If the diarrhea resists these remedies, they exhibit the fifth of a grain of the nitrate of silver, or one grain in the form of enema. To prevent the ulceration about the ankles, they should be protected by adhesive plaster.

Such is a very brief résumé of the authors' observations. Their principal value, as will be readily perceived, consists in the appreciation of the causes of the disease, and, more particularly, in tracing its connexion with the same circumstances which in the mother give rise to the severer forms of puerperal fever. The description of the more fatal form of the malady will be new to the majority of British practitioners, as it is only in the crowded wards of the Hôpital des Enfants Trouvés, and similar institutions, that it ceases to be a simple and manageable complaint.

35. *Spasm of the glottis.* This is one of the diseases the pathology of which the invaluable researches of Marshall Hall upon the excito-motory system of nerves have mainly contributed to elucidate. In a work already quoted,* Dr. Hall points out with great clearness the principal sources of irritation, and their remedies. Thus the irritation from dentition is to be met by free lancing of the gums, not confined to the apex of the alveolar processes only, but applied to their base. Indigestible food is to be removed by an emetic; the bowels are to be regulated by suitable purgatives; all causes of emotion are to be avoided; and, lastly, the morbid susceptibility of the patient is to be subdued by hyoscyamus and infusion of hops.

The enlargement of the thymus gland which has been made to play so important a part in the pathology of the disease by Kopp, and others of the German school, is declared by Dr. Hall to be the effect and not the cause of the convulsive breathing,—an opinion which has quite recently been supported by Mr. Simon,† but with the addition of an explanation of the manner in which the enlargement takes place, which is perfectly new, and

* Practical Observations and Suggestions, &c. p. 34.

† Physiological Essay on the Thymus Gland. London, 1845.

founded upon the physiological views of the uses of the gland, enumerated in the preceding part of his important work. As these views will be found in the Report on Anatomy and Physiology, we shall not dilate upon them in the present place, but shall allude to them only so far as may be necessary to render the explanation of the enlargement above mentioned intelligible. We may premise that the thymus gland, in the words of Mr. Simon, "is a sinking fund of nourishment in the service of respiration," that is to say, it is an apparatus ordained by nature to be a reservoir of combustible materials, ready to be supplied to the support of the respiratory process at a time when muscular action, and consequently waste of tissue, is at its minimum. This being the case, if the respiration be permanently, or for a long time together interrupted, it must be obvious that as the fluid secreted by the thymus gland will not be duly carried off, it must by degrees accumulate in the central cavity of the gland. It is to this accumulation, according to Mr. Simon, that the enlargement of this gland is due, and not to the hypertrophy of its secreting structure. As the disease in question offers precisely the conditions under which this accumulation takes place, there can be no difficulty in believing that those pathologists who look upon the enlargement of the gland as the cause of the suffocative paroxysm are in error.

A very clear exposition of the diagnostic features of this disease will be found in a paper published in the *Lancet* by Mr. Meade. We may observe also, in the last place, that Dr. Baird, of Ipswich, in an interesting paper read before the last meeting of the Suffolk branch of the Provincial Medical Association,* called the attention of the audience to the dependance of the disease upon an anemic state of the system, and detailed cases in which the paroxysms, after resisting the treatment which was instituted in reference to the existence of peripheric irritation, were speedily and completely subdued under the exhibition of iron, thus distinctly showing, as observed by the author of the paper, the source of the convulsion to be the effect upon the upper portions of the spinal cord of blood deficient in hæmatosin.

36. *Croup.* The value of tracheotomy in this disease has been much discussed of late, and although in this country it is regarded as almost an irrational operation, it has met with several supporters among continental physicians. The latest communications upon the subject are those by M. Thore† and M. Barrier;‡ the former has related a case in which the child was evidently relieved by the operation, but died through the negligence of the nurse; the latter writer, for the purpose of recommending as a new proceeding the use of the curved canula, apparently is unaware that it has been some time since introduced to the notice of the profession by Mr. Hilton of Guy's Hospital.

37. *Nocturnal incontinence of urine.* M. Delcour recommends the nitrate of potash and the benzoic acid in this troublesome affection, and M. Berenguier speaks in strong terms of pills composed of balsam of copaiba and the peroxide of iron. (31 and 32)

38. *Vesical calculus.* The expulsion of small calculi in infants has frequently been accomplished by M. Aberle,§ by means of belladonna used both internally and in frictions on the perineum. The object which he seeks to obtain by this method is the temporary paralysis of the muscular fibres in the neck of the bladder. He relates several cases in which calculi

* May 31, 1845.
† Gazette Médicale, Fev. 1, 1845.
‡ Bulletin Gén. de Thérapeutique, Nov. 1844.
§ Encyclographie Médicale, Fev. 1845.

the size of a pea were by this means expelled in the course of a few hours. The paralysis of the sphincter is quickly removed as soon as the medicine is withdrawn.

We have thus endeavoured to give a concise retrospect of the principal subjects of interest to the obstetric practitioner; many communications have been passed over, either because they do not possess any particular interest, or because they are published in a series which has not yet been completed.

The latter will be noticed in our next Volume.

IV.

REPORT ON THE PROGRESS OF ANATOMY AND PHYSIOLOGY.

The materials of which the Report on this department of medical science is composed, have, with very few exceptions, been selected from works published within the present year. From various unavoidable reasons it may happen that some contributions made to the subject of anatomy and physiology during the past few months, have been overlooked or unduly appreciated by the writer, and therefore not included in the present Report. It is hoped, however, that due allowance will be made for such omissions, the liabilities to which are so obvious.

§ 1.—*The Blood.*

1. Dr. G. O. Rees has recently offered some new views concerning the physical and physiological attributes of the blood.

1st. He has proved beyond doubt that the red corpuscles are vesicular, as is now generally supposed. Their vesicular character is clearly shown in the readiness with which they become collapsed or distended by increasing or diminishing the specific gravity of the medium in which they float. In order to collapse the corpuscles, a solution of sp. gr. 1060 is sufficient, but a solution of 1070 or more is required to produce a decided effect. Solutions cease to distend the corpuscles when of sp. gr. 1050 to 55, and to distend them well a solution of 1015 or 10 is desirable. The sp. gr. of blood is about 1057 to 60; and since the corpuscles remain unaltered by solutions of from 1050 to 60, it may be concluded that the average sp. gr. of liquor sanguinis lies somewhere between these two points; and this proves that the fibrine of the blood is dissolved, and not merely suspended in the liquor sanguinis.

2d. He has also rendered decisive the question as to where the red colouring matter of the corpuscle is seated, proving it to be contained in the fluid within the vesicle, and that the envelopes themselves are white or colourless membranes. This is shown by increasing the sp. gr. of the liquid in which the corpuscles float, the result of which is the escape by *exosmosis* of the red coloured fluid from within the corpuscles;* and again by applying water to the corpuscles, and so inducing *endosmosis*, the vesicles become distended and burst, their colouring matter mixes with the water, and their envelopes subside to the bottom of the vessel, forming a white layer.

3d. By examining the white layer deposited in the manner just mentioned,

* This is effected by a method somewhat similar to the one employed by M. Figuier for estimating the quantity of red corpuscles in the blood (British and For. Med. Rev. Jan. 1845, p. 254, Mr. Paget's Report.) M. Figuier's method consists in adding a strong saline solution, as of sulphate of soda, to the fibrinated blood, by means of which the corpuscles (their contents being exosmosed) will subside, and may be collected on a filter.

(in which, together with *granules* and shreds of membrane, are found numerous white bodies resembling blood-corpuscles, though smaller;) and from analogy, he entertains no doubt that the red corpuscles contain nuclei, which however are so highly refractive of light, that they are not distinguishable in the corpuscles themselves. He describes the nucleus as being about $\frac{1}{4500}$ of an inch in diameter, or $\frac{2}{3}$ the size of the red corpuscle, in the centre of which it is situated; it is flattened and circular like the corpuscle, though it differs from it in not being rounded at its edge; it is adherent to the envelope only at its centre, leaving a canal all round its free edge, which canal contains the red colouring matter.

4th. The whole of the iron of the blood is contained in the red colouring matter; the envelopes and nuclei do not present a trace of it. The corpuscles obtain their iron from the chyle, the serum of which holds a large quantity of it in solution; the sp. gr. of the chyle is considerably lower than that of liquor sanguinis; consequently, when the former becomes mixed with the blood, it dilutes the liquor sanguinis, and so induces an endosmodic current rich in iron to enter the corpuscles. How the colour of the contents of the corpuscles is produced remains a mystery; it is within the red corpuscles alone that it is effected, there is no red colouring matter in lymph or chyle, any admixture of red corpuscles found in these latter is an accidental circumstance attending the mode of examination.

5th. Dr. Rees seems to admit the probability of the exudation and fibrinous corpuscles observed so abundantly in effused coagulable lymph, having their origin in the pale corpuscles of the blood, for he sees no difficulty in these pale corpuscles passing through pores in the blood-vessels which would not admit the red corpuscles: the latter he compares to bladders filled with fluid, and which are not capable of yielding until their membrane be ruptured, but the former being soft solids may be compressed like a sponge, and pass through an opening, the orifice of which is smaller than the corpuscles themselves.

6th. He justly condemns the coarse and necessarily inaccurate method hitherto pursued in the quantitative analysis of blood. Amongst other fallacies attending the present method, the corpuscles are estimated as hematosine alone, no allowance being made for the envelopes or nuclei. Again, a certain quantity of fibrine will be estimated as hematosine, because, as the fibrine of the liquor sanguinis coagulates, the sp. gr. of the medium in which the corpuscles float, becomes lowered, and the corpuscles will thus draw into their interior more liquor sanguinis, and so absorb a certain quantity of fibrine with which they will subside. When the fibrine coagulates slowly, the quantity thus disposed of, will be large, for each of the immense number of corpuscles will absorb a little. Again, *all* the water of the corpuscles should not be estimated as belonging to serum, because, although the corpuscles must have endosmosed some serum during coagulation of the liquor sanguinis; yet, in their natural condition they contain a fluid which is quite distinct from serum. To obtain pure hematosine by a method free from these fallacies, Dr. Rees recommends the corpuscles to be cleaned by repeated washings in a solution of salt and water, or sugar and water, the sp. gr. of which is equal to that of the liquor sanguinis, so that the corpuscles may be unaffected by endosmosis. When thus cleansed, they are to be removed into a vessel of water, the result of which is, that the individual corpuscles swell and burst, their colouring matter is discharged into the water, whilst the nuclei and envelopes subside as a precipitate; both ingredients are thus in a fit condition for estimation and further examination.

7th. In regard to *genesis*, or the original formation of blood-corpuscles, he considers that they multiply by division, for on examining a portion of blood maintained at about its natural temperature, he observed the corpuscles to assume an hour-glass form, which increasing, eventually divided each corpuscle into two unequal sized circular bodies, which, when treated with a strong saline solution, underwent the same exosmotic changes as observed in common blood-corpuscles. When worn out, the blood-corpuscles become disintegrated and their debris exists floating in the liquor sanguinis. By diluting the serum of coagulated blood with water, a precipitate forms, consisting of the envelopes and nuclei of old corpuscles disintegrated; this disposal of the worn out corpuscles will account for the traces of iron occasionally found in the serum.

8th. Dr. Rees considers the explanation offered by Mülder regarding the mode in which the change of colour from dark to bright red is effected in the blood during its passage through the lungs, to be entirely hypothetical and erroneous. Mülder accounts for the change of colour from venous to arterial, and from arterial to venous blood in this way.* He supposes that "in traversing the capillary system of the lungs, the proteine of the blood combines with oxygen, generating a compound analogous to 'buffy-coat,' which forms a contractile covering to the blood-corpuscles, causing them to become more opaque, and giving them the figure of doubly concave lenses; that in the general capillary circulation, this layer of oxyproteine surrounding the corpuscles is decomposed, the oxygen being used for dissolving old tissue, and the proteine deposited to supply its place. The corpuscles lose their reflecting concave figure, and become more transparent by this change. That the difference of colour between arterial and venous blood depends solely upon a physical difference in the surfaces of the corpuscles, being semi-opaque concave mirrors in the former, and more transparent convex bodies in the latter; and that during respiration the colouring matter itself of the blood undergoes no change, and indeed plays no part, either as a whole, or in regard to the iron which exists merely as a simple element in it." To these several views Dr. Rees is entirely opposed; he rejects the idea of a layer of plastic oxyproteine being deposited on the blood-corpuscles during respiration, and instead of considering the hematosine as undergoing no change, and maintaining the same condition in arterial and venous blood, he looks upon it as being the cause of the change in colour of the blood in virtue of some chemical alteration which takes place in it. In this view he agrees with Liebig, though he does not adopt the explanation offered by this chemist as to the nature of this alteration. According to Liebig, the change in colour observed to take place during the passage of venous blood through the lungs is due to the formation of a carbonate of the peroxide of iron in the red corpuscle, which, during the passage of arterial blood through the system, is resolved into carbonate of the protoxide, by the abstraction of oxygen for the general purposes of the system, and thus the dark colour is again restored to the blood. This hypothesis is mainly disproved by the impossibility of obtaining any trace of an oxide of iron from the red corpuscles by treating them with a weak acid, by there being no difference in the quantity of oxygen in arterial and venous blood, and by all the iron admitting of extraction from the hematosine, without the other chemical constituents of the hematosine being interfered with, and especially without any diminution in the quantity of its

* Dr. Golding Bird, in London Medical Gazette, December 27, 1844.

oxygen being effected. What may be the nature of this change, therefore, in the hematosine (if any does really exist) on which the alteration in the colour of blood depends, remains still a mystery.

Having accounted for the change in colour in the blood whilst in the body by the alternate deposition and removal of a layer of plastic material by which an alteration in the form of the corpuscle is produced, and the change in colour follows as an optical effect, Mülder proceeded to explain in a similar manner the changes in colour undergone by the blood under various circumstances out of the body, such as result from exposure to the action of saline solutions of water and other reagents; in all these cases he considers that an alteration in the figure of the corpuscle is the cause of the change in colour observed, and that anything which produces this alteration in figure is capable of modifying the tint of the blood. Thus he considers that solutions of salt render a coagulum of blood of a bright red colour by exosmosing the corpuscles, and thus making them assume a biconcave form, and that when the corpuscles are endosmosed, and assume a convex form (as by washing the reddened coagulum in water) the colour of the blood is darkened in consequence; but Dr. Rees considers this statement to be incorrect, for saline matters will render a coagulum of a bright red colour, whether an endosmotic or an exosmotic action be induced; besides, blood-corpuscles may be changed in form, without any variation in the colour of the blood being produced in consequence. Moreover, strong saline solutions cause the corpuscles to become flaccid and empty, and not to assume that biconcave form which Mülder considers so well calculated for the reflexion of light. Mülder and others conceive that the iron in the hematosine has nothing to do with the colour of the blood, inasmuch as this metallic ingredient may be removed without the colour being destroyed; Dr. Rees objects to this being received as a conclusive argument against the iron being essential to the formation of the red colour.*

2. *Formation of the buffy coat.* Mr. Gulliver† has given the results of some experiments on the coagulation of the blood, which seem to add confirmation to the view entertained by Mr. Wharton Jones and others, that the formation of the buffy coat is due in great measure to an increased aggregation between the red corpuscles, by which these latter tend to arrange themselves in rolls, and consequently to subside to the bottom of the vessel more readily than they would do as individual corpuscles. With this tendency to rapid subsidence there is also usually combined a slowness in the coagulation of the liquor sanguinis, so that the corpuscles have time to leave the upper layers before coagulation commences. Mr. Hewson and Dr. Davy, however, maintain, that the rapid sinking of the corpuscles is due to an attenuation of the liquor sanguinis, but against this Mr. Gulliver argues, that if we admit the sinking of the red corpuscles to afford an accurate test of the consistency of the liquor sanguinis, we must also admit what seems improbable, that the liquor sanguinis becomes thinner some minutes after the blood has been withdrawn, for at that time the falling of the red corpuscles is most rapid. Following are some of Mr. Gulliver's conclusions:‡

* For an accurate analysis of the ashes of blood by Enderlin, and for an abstract of Scherer's and Mülder's recent investigations into the properties of the colouring matter of the red corpuscles, see Mr. Paget's Report in British and Foreign Medical Review, January 1845, p. 253.

† In a paper read to the London Medico-Chirurg. Society, an abstract of which is contained in the Medical Times, Feb. 22, 1845, p. 453.

‡ From Medical Times, Feb. 22, 1845.

1st. There is a remarkable acceleration after a few minutes, in the rate at which the blood-corpuscles sink in the liquor sanguinis. 2d. This acceleration may be increased by increasing the aggregation of the corpuscles; and prevented or reversed by preventing or destroying the aggregation of the corpuscles. 3d. The sinking of the corpuscles is slower in blood thickened by weak saline solutions, than when mucilage is added with the salt. 4th. The sinking of the corpuscles may be slower in serum artificially made thicker and heavier. 5th. In the cruor of horse's blood, the corpuscles are more aggregate, and have a greater appearance of agglutination, than in very buffy human blood. 6th. There may be a buffy coat, or only a comparatively thin one, in the blood of the horse, when the blood has been made thinner, and its coagulation retarded. 7th. The corpuscles of the horse sink much more quickly in his serum than the corpuscles of man do in his. 8th. Increasing the proportion of corpuscles in the blood hastens coagulation, and prevents or diminishes the formation of the buffy coat, more than increasing the serum only.

3. *Corpuscles.* Mr. Hobson* has examined microscopically the blood corpuscles of the ornithorhyncus, kangaroo, and phalanger. Those of the ornithorhyncus have the form of circular discs, like those of the most part of other mammalia, and their diameter differs but little from the diameter of the corpuscles of human blood, averaging about $\frac{1}{3000}$ of an inch. In the kangaroo the corpuscles are somewhat smaller, and in the phalanger they are about $\frac{1}{3500}$ of an inch. The corpuscles of the echidnè, which Mr. Hobson has also examined, resemble very closely those of the ornithorhyncus.

4. *Inflammation in cold-blooded animals.* M. Hereboullet† gives the particulars of an examination made on an alligator which had died of *peritonitis* occurring as a consequence of perforation of the intestine. Within the peritoneum were found all the characters of true inflammation; intense redness, effusions of lymph, false membranes, agglutination of the intestines and purulent secretion, proving beyond doubt the possibility of inflammation taking place in cold-blooded animals.

§ 2.—*Digestion.*

5. *Vomiting.* Some observations on the subject of vomiting have been offered by Mr. Paget‡ chiefly in reference to the agency of the diaphragm. The deep inspiration preceding the act of vomiting is terminated by the closure of the glottis; after this the diaphragm cannot move at all without expanding or compressing the air in the lungs, therefore it presents an unyielding surface against which the stomach may be pressed by the contracting abdominal muscles. Most probably, as observed by Mr. Anderson, the diaphragm remains during the act of vomiting in a state of rigid contraction, though were it even relaxed it would still present a resisting surface on account of the closure of the glottis. Another condition essential to vomiting is the relaxation of the oblique fibres of the stomach, which probably takes place exactly in coincidence with the contraction of the abdominal muscles, just as the relaxation of the muscles closing the glottis occurs coincidently with the contractions of the expiratory muscles in the acts of coughing, sneezing, &c.

6. *Intestinal villi. Lacteal absorption*:—It has long been a matter of

* Annales des Sciences Naturelles. Janvier 1845, p. 48.

† Gazette Méd. Fev. 1, 1845.

‡ British and Foreign Medical Review. January 1843, p. 274.

difficulty to explain how chyle, or the nutritive portion of chyme, found its way into the lacteals. The fancied existence of mouths or openings at the extremities of the lacteal tubes, as described by Mr. Cruikshank and Dr. William Hunter (and generally admitted during the period in which they wrote), as explanatory of the mode in which the lacteals and lymphatics in general performed their functions, seemed to remove this difficulty; but the researches of Krause, Valentin, and others, having disproved the existence of orifices in the lacteals, the mystery of absorption remained as great as before. Mr. Goodsir,* a few years ago, was one of the first to suggest that the process of lacteal absorption is effected through the medium of cells; and by recent observations he has proved almost beyond question that cells are the real agents by which the selection and absorption of the nutritive portions of the chyme take place. When viewed in this light, the matter is greatly simplified, especially since it is almost certain that nearly all the changes which are constantly occurring in the whole organic kingdom, on the grandest as well as the simplest scale, are effected through the agency of those minute, yet all-important bodies—nucleated cells. These cells seem endowed with a peculiar independent vitality, by means of which, at the time that they grow themselves, they are absorbing into their interior, from the surrounding medium, materials which they can convert either into the elements of tissue, as of muscle, nerve, bone, &c., if nutrition be the function assigned to them; or into some peculiar fluid of secretion, as of milk, bile, saliva, &c., if secretion be their especial object. Thus, growing themselves, they produce the growth of others, and by feeding themselves, they draw off waste materials from the body, and render them subservient to further useful purposes in the economy, or eject them from the system as refuse, by the natural outlets. The following comprises the substance of Mr. Goodsir's paper on the intestinal villi.† 1. Each time chyme passes along the intestines, the villi receive an increased supply of blood; they become turgid and erect, and the epithelium covering them is cast off, so that the chyme can come into actual contact with their exposed surface. 2. At the same time, the epithelia lining the follicles of Lieberkühn are also thrown off, and mix with the chyme contained in the intestines; they probably contain a secreted fluid, subservient to the process of chylification. 3. Each villus, besides its one or two looped lacteals, and the minute network of blood-vessels lining its walls, contains, in its quiescent state, scattered amongst the terminal loops of the lacteals, numerous granular particles which are the germs or nuclei of absorbing vesicles; during the process of chyme absorption, these minute germs become gradually developed into vesicles, probably by deriving nutriment from the neighbouring blood-vessels. Whilst they increase in size, these vesicles, by virtue of their peculiar absorbing power, draw into their interior certain materials from the chyme surrounding the villi, which they probably elaborate; having attained their full size, they burst, and discharge their contents either directly into the lacteals, or, more probably, into the texture of the villus, whence they are taken up by the lacteals. The function of the lacteals thus seems to consist in removing the debris and contents of the dissolved chyle cells. 4. Each villus is permanently covered (as also are the follicles of Lieberkühn lined) by a fine, smooth, germinal membrane,‡ containing in its substance germinal centres of an oval form, situated at pretty regular distances,

* Edinburgh Philosophical Journal, July 1842.

† Anatomical and Pathological Observations, by John and H. D. S. Goodsir, 1845, p. 4.

‡ See account of Germinal Membranes and Germinal or Nutritive Centres, by Goodsir.

the office of which is the production of fresh epithelium cells to cover again and protect the surface of the villus, after the absorption of chyme is ended. 5. This mode of absorption by the chyle cells renders the analogy very striking between intestinal villi and the spongioles of plants; the latter of which most probably absorb nutriment for the plant through the medium of their cells. The soil in this latter case holds a relation towards the spogioles somewhat similar to that of chyme towards the villi. 6. It is probable, that in the villi, as also in the spongioles of plants, the absorbed alimentary matters undergo the first steps of the organizing or vitalizing process.

The only difficulty which presents itself in the above theory of Mr. Goodsir, regarding the mode of absorption by the cells of the intestinal villi, is to understand how these cells can absorb materials for their own growth from the neighbouring blood-vessels, at the same time that they are also absorbing materials for the formation of chyle from the matters contained in the intestines; but this difficulty vanishes when we remember the wonderful endowments of cells in general, the power of selection and disposal of materials which they possess, together with other properties, showing that they are gifted with a peculiar independent vitality, to enable them to discharge certain important functions, the kinds of which vary according to the organs or tissues in which the cells are placed; besides, it does not seem improbable that, in the case of the cells of the intestinal villi, their own growth may be effected by means of the materials which they absorb from the chyme for the formation of chyle, and thus may be independent of the blood-vessels; for it does not appear that they ever grow, except when chylification is going on.

The epithelial coat of the villi seems to be chiefly destined for the protection of their surface at those times when absorption is not going on, since it is in all cases cast off when the process of absorption commences; probably also, in common with the epithelium lining the follicles of Lierberkühn, it serves some further purpose in preparing the chyme for absorption. Proof that the epitheal coat is thrown off during the passage of chyme along the intestines, removes the difficulty which it was conceived the cells would experience in effecting their absorption through the layer intervening between them and the chyme. The thin germinal membrane would be no impediment to the process of absorption; on the contrary, it would rather be favorable to it. Mr. Fenwick, of North Shields, has performed numerous experiments, and worked out very elaborately the subject of lacteal and lymphatic absorption, though the results he has attained do not help much in clearing the mystery which still to a certain extent hangs over this department of physiology.*

7. *Structure of the Liver.* In alluding to Müller's recent paper on the structure of the liver, in which this physiologist maintains the lobular arrangement of the component parts of this organ, Mr. Paget† says, "The only point in which I think Müller is wrong, is in describing the partitions as formed of fibro-cellular tissue. If one be cut from the interior of the liver, it will be found covered on both sides with hepatic cells and granules, which adhere to it much more firmly than those in the interior of the lobule do to one another. When these are scraped off, there remains a very thin and tough membrane, in which there are only a few filaments of fibro-cellular tissue,

* The results of his investigations are contained in four consecutive numbers of the Lancet, commencing Jan. 11, 1845.

† British and For. Med. Rev. Jan. 1845, p. 276.

and which appears to be composed of a very dense network or networks of vessels, with gland-cells still adhering among them. The appearances presented in the pig's liver are such as to indicate that its lobules are by no means generally or uniformly traversed by plexuses of ducts; in their interior they appear to contain only large nucleated biliary cells, with various granules loosely arranged; the ducts appear only in the walls of the lobules."

8. *Functions of the Bile.* Following is Mr. Paget's analysis of the recent experiments by Schwann, relating to the functions of the bile. "The experiments lead to the distinct conclusion of the bile being indispensable to life. They consisted in removing a portion of the common bile duct, and establishing an external fistulous opening into the gall-bladder, so that the bile might be naturally secreted, but be discharged externally, and not permitted to enter the intestine. Their general result was, that of 18 dogs thus operated on, 10 died of the immediate consequences of the operation, and of the remaining 8, 2 recovered and 6 died. In the 6 which died, death was the result of nothing but the removal of the bile; after the third day, they daily lost weight, and had all the signs of inanition, e. g. emaciation, muscular debility, uncertain gait, falling of the hair. They lived from 7 to 64 days after the operation; and the inanition was the greater the longer they survived. Young dogs appeared to die rather sooner than old ones. Licking the bile as it flowed from the fistula, and swallowing it, had no influence on the consequences of the operation. In the 2 dogs that recovered, the importance of the bile was equally well shown; for on these being examined it was found that the passage for the bile into the intestine had been restored; and the period of its restoration was distinctly marked by their weight (which had previously been regularly decreasing) being augmented and continuing to increase till it amounted to what it was before the operation; and also by the fistulous opening into the gall-bladder healing and the discharge of bile ceasing.*

§ III.—*Circulation.*

9. *Venous pulse.* M. Martin Solon† has given the details of two cases in which he observed pulsation of the dorsal veins of the hands. The patients had both been repeatedly bled, and taken tartar-emetic, for an attack of pleuro-pneumonia. The veins were prominent, rounded, of a blueish-red colour, and presented a diastolic and systolic movement, easily appreciable by the eye, and synchronous with the pulse: it was evidently not communicated by any adjacent vessels. Upon pressing the fingers, the pulsations ceased, but when the wrists were pressed, they remained as before. When the brachial artery was pressed, the pulsations of the radial and ulnar arteries, and of the dorsal veins of the hand, all disappeared together. In both cases, the patients gradually recovered. In one the venous pulsation appeared on the fifteenth day and remained seven days, the cardiac impulse being strong: in the other, the heart's impulse was feeble, and the venous pulsation remained for a shorter time. M. Solon explained the phenomenon of venous pulsation in these cases, by supposing that the abnormal fluidity of the blood facilitated its passage through the capillaries, and thus enabled it to retain the impulse communicated by the

* Brit. and For. Med. Rev. Jan. 1845, p. 276.

† In a memoir read before the Academy of Sciences, Paris. Lancet, January 4, 1845, and Bulletin des Académies, Novembre, 1844, p. 24.

heart. He alluded to similar cases by Dr. Graves and Dr. Ward.* Pathologically, he thought the phenomenon important, as indicating a state of fluidity of the blood, which would render further bleeding inadvisable. Physiologically, it was important, as proving that the entire circulation is under the influence of the heart. In a discussion which ensued after the reading of the memoir, M. Poiseuille agreed with M. Solon in considering the phenomenon as another proof of the influence of the heart over venous circulation, but could not attribute it to the greater fluidity of the blood, for the experiments of Magendie and himself had proved that the more aqueous the blood became, the greater was the difficulty with which it passed through the capillaries, owing to imbibition. He thought it, therefore, more correct to explain the influence which loss of blood evidently had in producing venous pulsation, by considering the heart as having lost energy, whereby a smaller quantity of blood is thrown into the arteries, which being less dilated contract with less force, and thus lose their power of converting the intermittent fluid into a continuous one, as is normally the case.

10. *Moving powers of the blood.* Dr. Calvert Holland, in a recent work on the circulation,† has raised objections to most of the now generally admitted truths respecting the agencies concerned in carrying on the circulation, as established by the experiments of Sir David Barry, Poiseuille, Magendie, and many others. Dr. Holland has displayed considerable ingenuity in enforcing his arguments, and in some particulars he is correct, but, on the whole, his objections are not sufficiently weighty to entitle their being received as valid. He has dealt so much at length with his arguments, that even an abstract of them cannot be given here.

11. *Agency of the pericardium in the circulation.* Mr. J. H. Walshe, of Worcester,‡ has offered an ingenious theory to explain how that imaginary difficulty, the return of venous blood to the heart, contrary to gravity, may be overcome. He considers the pericardium, by virtue of its structure and arrangement, to be the chief agent, (through the medium of the ventricles), by which this object is effected. He compares the human pericardium to an unyielding tent or box, and considers it so firmly fixed at its several points of attachment, as to be capable of resisting considerable pressure from without, and of not yielding to the various movements of the inclosed heart. Assuming this arrangement to be true, and the cavities of the heart with their contained blood always to occupy a given space, which is maintained of the same dimensions by the pericardium, Mr. Walshe reasonably infers that, as the ventricular contraction forces out a certain amount of blood, an equivalent proportion must rush into the auricles, otherwise a space would exist within the unyielding pericardium, resulting from the contraction and emptying of the ventricles. In this way, he revives the old notion, which attributed to the ventricles a sucking as well as a propelling power. This ingenious theory will hardly be found reconcileable with facts. The human pericardium and its attachments are more yielding than Mr. Walshe admits; witness the large effusions occasionally contained within its cavity, the great displacement of the heart and pericardium induced by pleuritic effusions, emphysematous lungs, &c. Again, the pericardium must be somewhat yielding to allow of its parietal

* London Medical Gazette, 1832, p. 376. Dr. Ward accounted for the phenomenon of venous pulsation in the way above suggested by M. Solon.

† Philosophy of the Moving Powers of the Blood. London, 1844.

‡ Provincial Medical and Surgical Journal, Feb. 5, 1845.

surface following the sternum upwards and forwards, and the diaphragm downwards, during inspiration; for the great vessels at the base to which the pericardium is attached form a fixed unyielding point. The existence of this amount of flaccidity renders it pretty certain that the pericardium and surrounding soft textures will readily fall in, and fill up the space left by either the ventricular or auricular contraction. To these, other arguments might be offered, as the existence of an adherent pericardium without consequent hypertrophy of the heart; one or two instances of a heart without a pericardium; but the above are sufficient to render doubtful this new attribute of the pericardium, the advantage of which, indeed, were it to exist, would be trifling, for the amount of force expended by the ventricles in suction would be of greater ultimate advantage if entirely directed to the onward current. The difficulties attending the return of venous blood to the heart are, moreover, greatly overrated.

Mr. Walshe assigns another useful purpose resulting from this assumed arrangement of the pericardium, that of entirely preventing regurgitation from the auricles, and thus dispensing with valves at the mouths of the large veins. This again is hardly tenable, for auricular regurgitation does to a certain extent take place, as shown in the experiments of Barry and Poiseuille, where, during the diastole, fluid rose in the tube inserted into the jugular vein: further regurgitation is prevented by the contraction of the muscular fibres which surround the mouths of the large veins opening into the auricles.

§ IV.—*Respiration.*

12. *Physiology of asphyxia.* Mr. Erichsen, in a recent admirable essay,* states that the cause of the stoppage of the circulation in asphyxia is threefold, depending:—1st. Upon the arrest of the respiratory movements; the influence of this agent is comparatively trifling.—2d. Upon the weakening of the heart's action; this has an important influence in arresting the circulation. The enfeebled condition of the heart results from the circulation through its muscular substance of blood deprived of its stimulating arterial qualities, and diminished in quantity. When a due supply of arterial blood is furnished to its muscular substance, the heart is enabled to propel even black blood through a lung entirely deprived of air; this, Mr. Erichsen proved by an experiment of tying the right bronchus of a dog, at the same time keeping up artificial respiration through the left lung; in nine minutes after the ligature of the bronchus, he tied one of the pulmonary veins of the same side, and then punctured it on the distal side of the ligature. Black blood flowed from the puncture, and continued to ooze for eight minutes, when the experiment was discontinued. During the whole time not a bubble of air gained admission into the right lung, (consequently, all chemical changes in it must have ceased,) yet black blood continued to circulate through it; during this time the heart was supplied with arterial blood from the left lung.—3d. Upon obstruction offered to the passage of venous blood through the lungs. This results not from paralysis of the minute pulmonary vessels, in consequence of their proper "nervous influence" being destroyed by the circulation of venous blood through the medulla oblongata, for Mr. Erichsen proved that the circulation ceases as quickly in an animal whose trachea is closed, when arterial blood from another animal is supplied to its brain and

* Edinburgh Medical and Surgical Journal, January 1845.

medulla oblongata, as when these parts are permeated by vneous blood. Neither, again, does this obstruction depend upon the mere arrest of chemical changes between the air and blood, for these changes cease in two minutes after closure of the trachea, whereas the circulation continues, and the femoral artery pulsates for six minutes longer. The cause of this obstruction in the pulmonary circulation, advocated by Mr. Erichsen, is the refusal of the minute pulmonary veins (not the capillaries) to receive venous blood, which stimulates them to contract upon their contents. This action is contrary to what the general sedative properties of venous blood would lead us to expect; but he explains it by reference to the examples of substances acting as *sedatives* to one surface and *stimulants* to another, although the surfaces may not present any appreciable difference in structure. In a similar manner, the minute systemic arteries contract upon and obstruct the flow of venous blood through them, thus offering a further obstacle to the already enfeebled heart.

These various impediments to the heart's action increasing, especially the circulation of venous blood through its muscular substance, its contractions cease, and with this cessation occurs the extinction of organic life, which usually takes place under ten minutes from the commencement of the asphyxiating cause; although perfect insensibility and loss of voluntary movement occur in about one and a half or two minutes, in consequence of the circulation of unoxygenized, unstimulating blood through the brain; the medulla oblongata preserves its functions somewhat longer.

13. *Minute structure of the lungs.* The following abstract of a paper lately read by Mr. Rainey, before the Medico-Chirurgical Society, is taken from the *Medico-Chirurgical Review.**

1st. A bronchus, when traced from its commencement to its termination, is seen to be, in the first part of its course, more or less cartilaginous; it then becomes destitute of cartilage, retaining, however, a perfectly circular form, and having no air-cells opening into it; farther on, being still circular, numerous air-cells open into it; lastly, the air-cells increase so much in number, and open into the bronchus so closely to one another, that the tube can no longer retain its circular form, but becomes reduced to an irregular passage, running between the cells, and ultimately reaching the surface of the lobule, ends by forming a terminal air-cell.

2d. The air-cells are small irregularly-shaped cavities, having generally four or five unequal sides; those which are situated close to the small bronchial passages open into them by well-defined circular apertures, whilst those which are situated at a distance from these passages open one into the other—an arrangement which those who are acquainted with the disposition of the air-cells in the injected lung of the frog and serpent will readily comprehend; in fact, each lobule of the lung of the mammal and man, with its bronchial passages and appended cells, may in some sort be regarded as a repetition of the whole lung of the frog.

3d. The border of each air-cell is surrounded, in addition to the epithelium, by a number of fibres definitely arranged in a circular manner, so as to form a circumscribed limit to each cell. The fibres appear to be elastic, and have no resemblance whatever to muscular fibres, striped or unstriped.

4th. The sides or walls of the air-cells consist of a dense plexus of capillaries, situated in the interior of the lobules, between two layers of the pulmonary membrane; but, on their exterior, between this membrane and

* April 1845, p. 330; also see notice of the same paper in the London Medical Gazette, April 4, 1845.

the pleura, in the case of the lobules on the outer surface of the lung, or between it and the interlobular areolar tissue in those lobules which bound the interlobular spaces. There is thus, between every two cells, only one vascular network, so that the small stream of blood in each capillary vessel is acted on by the air upon both sides; whilst, in the frog, serpent, &c., there being two plexuses of vessels between two cells, the blood in the capillaries is only aerated on one side.

5th. The number of capillary plexuses is not the same as that of the air-cells, one network passing between and supplying several cells; or, in other words, one terminal branch of the pulmonary artery supplies the plexuses of several air-cells.

6th. The fœtal lungs, prior to the act of respiration, when well injected, are distinctly seen to possess air-cells, fully formed and surrounded, as in the animal which has respired, by plexuses of blood-vessels.

M. Rochoux's* account, so far as it goes, corresponds with the above accurate description given by Mr. Rainey. According to M. Rochoux's calculation, the number of pulmonary cells amounts to about 600,000,000, and there are about 17,790 grouped around each terminal bronchus.

§ V.—*Structure and Formation of Tissues.*

14. *Structure of lymphatic glands.* Some information concerning the internal structure of lymphatic glands has been afforded by Mr. Goodsir.† The interior of each lymphatic and lacteal gland is made up of anastomosing ramifications of the afferent and efferent lymphatic vessels—these anastomosing branches are arranged very closely together, their external surfaces being separated from each other by a very fine capillary network formed by the blood-vessels of the gland. The extra-glandular lymphatics as they enter the gland lose their external filamentous coat, which becomes continuous with the capsule of the gland—their middle fibrous coat also disappears shortly after the vessels have entered the gland. The internal coat is therefore the only remaining texture of the intra-glandular lymphatics; this coat becomes greatly thickened and opaque. It consists of a fine transparent external membrane, containing ovoidal nucleated cells (germinal spots) placed at regular distances along it. Within this external membrane, and almost filling up the canal of the lymphatic vessel, is a thick layer of nucleated epithelial particles; this layer is thickest in the lymphatics towards the centre of the gland, and gradually diminishes towards the circumference, where it becomes continuous with the layer of flat epithelium scales of the extra-glandular lymphatics. The epithelial particles are on an average about $\frac{1}{5000}$ of an inch in diameter. They are probably being constantly (though with periodically increased activity as during the passage of lymph or chyle) developed from the germinal spots of the external membrane, and when formed they probably discharge some important function towards the lymph or chyle contained in the canal, and with which they are always in contact.

15. *Secreting structures.* The following comprises an abstract of the chief points contained in an excellent paper by Mr. Goodsir;‡ the subject relates to the function of secretion as well as to the structure of secreting organs, and is in many respects original.

* For a notice of which see Gazette Médicale, Janvier 4, 1845, p. 14.

† L. c. p. 44.

‡ L. c. page 20, et. seq.

1st. Secretion is essentially a function of nucleated cells. The cells endowed with this property of secretion possess a peculiar organic power by which they can draw into their interior certain kinds of materials varying according to the nature of the fluid they are destined to secrete. Some cells have merely to separate certain ingredients from the surrounding medium, others have to elaborate within themselves matters which do not exist as such in the nutritive medium.

2d. Though secreting cells thus differ in the nature of the fluid which they secrete, (as whether milk, bile, saliva, or other,) their structure seems to be nearly the same in all cases; each consisting, like other primitive cells, of a nucleus, cell-wall, and cavity.

3d. The nucleus seems to be both the reproductive organ by which new cells are generated, and the agent for separating and preparing the secreted material. The cell-cavity seems destined chiefly to contain the secreted fluid until ready to be discharged, at which time, the cell then matured, bursts and discharges its contents into the intercellular space in which it is situated, or upon a free surface, as the case may be.

4th. The mode of secretion in glands of which the testicle of the *squalus cornubicus* may be taken as a type, seems to be the following.* Around the extremities of the minute ducts of the glands are developed acini or primary nucleated cells, each of which as it increases in size has generated within it secondary cells, the product of its nucleus. The cavity of the parent cell does not communicate with the duct on which it is situated until its contents are fully matured, at which time the cell-wall bursts, or dissolves away, and its contents are discharged into the duct. From this constant succession of growth and solution of cells, it results that the whole parenchyma of a gland is continually passing through stages of development, maturity, and atrophy, the rapidity of which process is in proportion to the activity of the secretion. There seems, therefore, to be no essential difference between the process of secretion and the growth of a gland, the same cells are the agents by which both purposes are effected; the parenchyma of glands is chiefly made up of a mass of cells in all stages of development; as these cells individually increase in size and so constitute their own growth as well as that of the common glandular mass, they are at the same time elaborating within themselves the material of secretion, which, when matured, they discharge, by themselves dissolving away. There are a number of germinal spots or centres in a gland from which acini or primary cells are developed.†

5th. The true fluid of secretion is not the product of the parent-cell of the acinus, but of its included mass of secondary cells, which themselves become primary secreting cells, and form the material of secretion in their cavities. In some cases these secondary cells pass out entire from the parent-cell constituting a form of secretion in which the cells possess the power of becoming more fully developed after being discharged and cast into the duct, or cavity of the gland.

6th. In the order of glands, which consist of follicles more or less elongated, the following is the arrangement:‡ At the blind extremity of each

* Conglomerate glands in general, as the salivary glands, pancreas, &c., may be included in this class, though individual differences as to the arrangement, and other peculiarities of the cells, occur in each.

† Vide account of germinal spots, or nutritive centres, page 263.

‡ Under this class may be included the follicular glands of the mucous membrane of the stomach, &c.

follicle is situated a germinal spot at the centre of which is constantly or periodically developing nucleated cells. These cells, as they become developed, tend towards the open extremity of the follicle. At first they are simple nucleated cells, but as they advance they gradually assume the characters of primary secretory cells, and contain secondary cells in their interior. When fully matured and arrived at the attached extremity of the follicle, the primary cells burst and allow their contents to pass into the branch of the duct to which the follicle is attached. Each follicle is virtually permanent, though both its contained cells and its walls are continually undergoing change, receiving development and addition at the blind extremity, being absorbed and disappearing at the other.

7th. Mr. Goodsir considers that the process of original development of glands in the embryo is identical in its nature with the growth of a gland during its state of functional activity. The blastema which announces the approaching formation of a gland in the embryo, in some instances precede, and is in other instances contemporaneous with, the conical blind protrusion of the membrane upon the surface of which the future gland is to pour its secretion. In certain instances it has been observed that the smaller branches of the ducts are not formed by continued protrusion of the original blind sac, but are hollowed out, independently, in the substance of the blastema, and subsequently communicate with the ducts. It appears highly probable, therefore, that a gland is originally a mass of nucleated cells, the progeny of one or more parent-cells, and that whether the membrane in connexion with the embryo of the gland sends a conical protrusion into the mass or not, the extremities of the ducts are formed as closed vesicles, and then nucleated cells are formed within them, and are the parents of the epithelium cells of the perfect organ.

16. *Structure of serous membranes.* Mr. John Goodsir* offers the following observations on the structure of serous membranes. A portion of the human pleura, or peritoneum, consists, from its free surface inwards, of a single layer of nucleated scales; of a germinal membrane, (vide account of, by Mr. Goodsir); and of the sub-serous areolar texture intermixed with occasional elastic fibres. The blood-vessels of the serous membrane ramify in the areola texture. The germinal membrane seldom shows the lines of junction of its component flattened cells. These appear elongated in the form of ribands, their nuclei, or the germinal spots of the membrane, being elongated, expanded at one extremity, pointed at the other, and somewhat bent upon themselves; they are bright and crystalline, and may or may not contain smaller cells in their interior. If these germinal centres be the sources of all the scales of the superficial layer, each centre being the source of the scales of its own compartment, then the matter necessary for the formation of these during their development must pass from the capillary vessels to each of the centres, acted on by forces whose centres of action are the germinal spots; each of the scales, after being detached from its parent centre, deriving its nourishment by its own inherent powers.

17. *Structure of bone.* Mr. Goodsir† describes the soft portion of bone to be situated within the bone-corpuscles, and to consist in each corpuscle of a little mass of nucleated cells of great transparency; the soft portion, therefore, is not continuous like the hard, but is divided into as many portions as there are corpuscles.

2. The hard portion of bone is made up of cells filled with bony sub-

* L. c. page 41.

† L. c. page 64, et seq.

stance, and ossified or calcified primordial cells, which cells as they grow old are constantly dissolving, and their debris falling back into the returning circulation, whilst new ones are becoming formed from the mass of nucleated cells (which are so many centres of nutrition) within the bone-corpuscles. Each of these centres of nutrition is constantly absorbing nutritive materials from the blood-vessels through the medium of the calcigerous canals, and appropriating them partly for the nourishment of the existing calcigerous cells, but more especially for the formation of new ones, which it supplies to all parts within its own territory, or within the range of its own system of calcigerous canals.

3d. The hard and soft parts of bone, which when combined constitute the true osseous texture, only differ from each other in this, that the cells of the one are ossified, those of the other retain their original delicacy and softness.

4th. In every true bone there exists, between the blood-vessels and the walls of the Haversian canals, a layer of cellular substance, the cells of which Mr. Goodsir considers to be the descendants of the corpuscles of the cartilage or matrix in which the bone was originally formed; for in the original development of the bone around each cartilage-corpuscle, are formed a number of secondary corpuscles which arrange themselves in a linear series, the rows of which assume a direction perpendicular to the ossifying surface. These secondary cells remain as centres of nutrition for the future bone, whilst the progeny formed from each constitutes a cellular mass; around each such cellular mass, the capsules, or laminæ, of compact primary bone become formed, and when these capsules have opened into each other, they form Haversian canals, the blood-vessels within which are separated from the walls of the canals by the layer of cellular substance. The great extent of, and the prominent position held by this cellular substance in the development of bone, proves that it must play some important part in bone economy. In adult bones this cellular substance is, in the medullary cavity, cancelli, and to a certain extent, in the larger Haversian canals, replaced by fat-cells.*

Relative proportions of animal and earthy matters in bone. Dr. Stark has made some very numerous analyses of bones, chiefly with the view of determining the proportional amounts of earthy and animal matters in the bones of the different classes of vertebrate animals. He has examined human bones, and those of an extensive number of mammalia, birds, reptiles, and fishes, and has given a comprehensive table showing the results.† The most interesting conclusions to be derived from these experiments, are:—1st. The proportion of earthy and animal matters in the bones varies but little over the whole animal kingdom; wherever a true bone occurs, that bone contains nearly the same average amount of earthy and animal matters; therefore, the statement that the higher we ascend in the scale of organization, the larger amount of earthy matters do the bones contain, is fallacious. 2d. The animal matter composes about one third of the weight of the dry clean bone: thus the mean proportion in bones of all vertebrate animals is 66·09 per cent. of earthy, 33·91 of animal matter; the mean proportion in the bones of man is 66·61 earthy, 33·39 animal matter. The proportion of earthy matters in the bones of wild mammalia seems to be a fraction higher than in the domesticated animals. 3d. Age does not seem to increase the amount of earthy matters in the bones, as is generally supposed. 4th. The

* For a further account of the development of bone, see an analysis of Bidder's Researches in Mr. Paget's Report, p. 589 of Brit. and For. Med Rev. April 1845.

† Edinburgh Medical and Surgical Journal, April 1845, p. 313.

hardness of bone does not depend on the amount of earthy matter contained in it, as is shown in the readiness with which the bones of fish may be cut, although they contain as large an amount of earthy matter as the ivory-like leg bones of the deer or sheep. 5th. Neither increased flexibility, nor transparency of bones (as in the bones of fish) depends on a diminished proportion of earthy solids in its texture; but like that of increased hardness, probably on the peculiar structural arrangement of the tissue. The great fault in the analysis of bones hitherto published is, that the amount of animal matter has been rated too high, probably from want of care in drying the bones and properly freeing them from fat or oil previous to burning. Dr. Stark alludes to the excessive fragility of human bones as contrasted with those of animals, so that when prepared for chemical examination and deprived of their membranes and fat, they may be readily crushed by firm pressure between the finger and thumb; whereas, the bones of the lower animals similarly prepared, will bear the roughest handling without injury. He suggests that this circumstance might account for the fact of human bones never being met with in those tertiary deposits in which the bones of lower animals are so abundant.

18. *Vessels in fat, smaller than capillaries.* Mr. Smee* describes a new set of minute vessels existing as appendages to fully developed fat, and to which he gives the name of "Vasa adipis." These minute vessels measure from about $\frac{1}{10000}$ to $\frac{1}{25000}$ of an inch in diameter; they are given off from the capillaries and are distributed at every angle of each fat-cell. They exist only in fat, the globules of which have assumed their polygonal form. Although the term vessel is applied to these structures, yet Mr. Smee states that no evidence whatever can be adduced either of the existence in them of a cavity or of distinct walls, beyond their being permeable by fluid injections, [which in ordinary cases would indicate the existence of a cavity.] Mr. Smee suggests nothing as to their function, but states that they must not be considered as vasa serosa, which system of vessels are, in all probability, quite imaginary. [The existence of these vasa adipis requires further confirmation.]

19. *Centres of nutrition.* Mr. Goodsir† has recently made several important additions to the doctrine of cell-formation. Amongst other observations he states that, besides all organs and tissues having their origin in and consisting essentially of simple or developed cells possessed of a peculiar independent vitality, these component cells are moreover divided into numerous departments, each of which consists of several cells arranged round one central or capital cell, which latter is the source whence all the other cells in its own department have derived their origin. To each of these several central nucleated cells, he applies the name of *nutritive centre*, or germinal spot. Each nutritive centre possesses the power of absorbing materials of nourishment from the surrounding vessels, and of generating, by means of its nucleus, successive broods of young cells, which from time to time fill the cavity of the parent cell, and carrying with them its cell-wall, pass off in certain directions and under various forms, according to the texture or organ of which their parent forms a part. There are two kinds of nutritive centres, those which are peculiar to the textures, and those which belong to the organs. The former are in general permanent, the latter are mostly peculiar to the embryonic state, and ultimately disappear. There is one form in which the nutritive centres are arranged both in healthy and morbid

* London Medical Gazette, April. † L. c. page 1.

parts, which constitutes what Mr. Goodsir calls a *germinal membrane;* it is only met with on the free surface of organs or parts; it is a fine transparent membrane, and consists of cells arranged at equal or variable distances within it; the cavities of these component cells are flattened, so that their walls form the membrane by cohering at their edges, and their nuclei remain in its substance as the germinal centres. One surface of the membrane is attached to the surface of the organ or part, and is therefore applied upon a more or less richly vascular tissue; the other surface is free, and it is on it only that the developed or secondary cells of its germinal spot are attached. These secondary cells, whilst forming, are contained between the two layers of the germinal membrane, but, as they become fully developed, they carry forward the anterior layer and become attached to the free surface, whilst the nuclei are left in the substance of the posterior layer, in close contact with the blood-vessels from which they derive the materials for the formation of new cells.

§ VI.—*Nervous System.*

20. *Functions of the cerebrum and cerebellum.* Dr. Cowan* has related two cases of encephaloid carcinoma of the brain, the details of which offer some points of considerable physiological interest. One case is peculiarly instructive, as showing the great amount of cerebral lesion which may exist without being accompanied with any disturbance of the intellectual faculties, and with but slight interruption to the functions of the nervous system generally. The case was chiefly characterized during life, by the occurrence of paroxysms of severe pain in the head, which was at first limited to the left side, but eventually became general. These paroxysms were accompanied by severe pain in the right arm and right leg, during the continuance of which the right arm was relaxed and motionless, but regained its power when the pain subsided; this was the only appearance of paralysis noticed; as far as could be ascertained, the sensibility of the arm was not diminished, and the right leg did not participate in the temporary paralysis of motion. There was occasional disturbance of vision in the right eye; and tinnitus of the right ear was a constant symptom; it consisted of a whizzing pulsating noise. There was no appreciable mental disturbance, and the patient walked down stairs the day on which she died. On examining the brain, the greater portion of the medullary substance of the right hemisphere, as also a large portion of that of the left hemisphere, was found converted into a red pulpy mass, presenting all the characters of ordinary encephaloid carcinoma. The gray portion was perfectly healthy to all appearance, which seems to support the favoured doctrine that it is the seat of the intellectual powers. Dr. Cowan suggests that the constant tinnitus may be explained by considering it to have been dependent on the pulsation of the diseased and softened middle lobe resting on the temporal bone, combined also with the morbidly increased sensibility of the parts.

The second case is still more interesting and instructive. It seems to prove very strikingly the truth of the now generally admitted opinion, that the chief function of the cerebellum is to produce a combined and harmonious action of the several muscles called into movement for the attainment of a given end, as in locomotion, &c. It also, as well as the last, illustrates the apparent dependence of the intellectual faculties on a healthy condition of the gray cerebral matter. On examining the brain in this case, there was

* Provincial Medical and Surgical Journal, April 16th, 1845.

found a mass, presenting the characters of encephaloid carcinoma, incorporated with the anterior extremity of the left lobe of the cerebellum, of which it seemed a prolongation; passing forward in inseparable connexion with the pons, and following the emerging fibres of the corresponding crus cerebri, it terminated about an inch further (without penetrating the ventricle), in the medullary substance of the middle lobe of the left hemisphere; the principal seat of the morbid change was in the commissural fibres which contribute to the formation of the pons. The medullary substance was alone diseased, the gray matter being distinct, and to all appearance healthy. The several nerves passing through the diseased mass were more or less vascular and soft, which would account for the various disturbances in function presented during life by the parts to which they were distributed, as deafness, &c.

The chief points in the symptoms of this case to which attention need be directed in this notice are, that there was no paralysis of motion or sensation to the last, no convulsive movements, neither was one side of the body more distinctly implicated than the other, but the controlling, the coordinating power of the muscular system appeared abolished or nearly so; thus, in the early part of the affection, the patient staggered during walking, as if slightly intoxicated, and was unable to direct her progres in a straight line, she constantly deviated to the left; as the disease advanced, the irregularity in the voluntary movements increased, and gradually affected the arms as well as the legs. She required to be held and directed in every act, supported at times by two assistants, and pushed forwards by a third to enable her to move about the room; and if by accident she fell when attempting any effort alone, she was quite unable to raise or to assist herself. She was perfectly sensible throughout, and the only change in her mental condition was a kind of restless excitement, with a certain indescribable feeling of distress, a childishness of thought with great feebleness of memory and attention: often intervals of unexpected and remarkable revival of natural feelings and mental powers would occur, the cause of which is quite inexplicable.

A curious case is related by M. Blaquière,* in which a ball discharged from a pistol struck a child, aged four years and a half, on one temple, traversed the brain, and passed out at the other temple; the child survived until the 29th day after the accident. When seen by M. Blaquière upon the 20th and several subsequent days, he was found sitting up in bed, amusing himself with his playthings, and eagerly calling for more food than was allowed him; he was lively and cheerful, except during the dressing of the wounds, manifesting the possession of all his mental faculties. After death it was found that the cranium had been perforated about an inch and a half above the external orbital process on each side; the anterior part of both cerebral hemispheres had been traversed by the ball; in front of the canal occasioned by its passage, there was a layer of cerebral substance six or eight lines in thickness, the gray matter above the canal was untouched, the ventricles of the brain were also uninjured.

21. *Reflex function of the brain.* In a paper read before the last meeting of the British Association at York,† Dr. Laycock offered further evidence confirmatory of his opinion published four years ago, that the brain, although the organ of consciousness, was subject also to the laws of reflex

* See London Medical Gazette, May 2, 1845.

† British and Foreign Medical Review, January 1845, p. 298, et seq.

action, and that in this respect it did not differ from the other ganglia of the nervous system. He was led to this opinion by the general principle that the ganglia within the cranium being a continuation of the spinal cord must necessarily be regulated as to their reaction on external agencies by laws identical with those governing the functions of the spinal ganglia, and their analogues in the lower animals; and on investigation he found that observations and arguments like those satisfactorily adduced in proof of the existence of the reflex function of the spinal ganglia, might be brought forward in proof that the cerebral ganglia have similar endowments.

He considers that the cerebral nerves, but especially the optic, auditory, and olfactory, are incident excitor nerves; that impressions made on them will pass on to the central axis, thence be communicated to the motor nerves, and thus give rise to combined muscular acts, or irregular and spasmodic movements. Similar acts may also have a centric origin, the exciting cause being *within* the brain. These acts may likewise be shown to be instinctive. In these particulars there is an evident analogy with the reflex functions of the spinal cord. To prove this, we must apply the natural stimulus to these nerves; thus light must impinge on the optic nerve, sound on the auditory nerve; pricking or tearing will have no effect in proving their reflex influence. Dr. Laycock mentions hydrophobia as presenting a good illustration of these cerebral reflex movements. The acknowledged excito-motory phenomena of hydrophobia may be induced, 1st, Through the sensual nerves of touch, as by the contact of water with the surface of the head, hands, chest, the lips and pharynx. 2d, By a current of air impinging on the face or chest. These causes act undoubtedly on the incident nerves of the cord, as mentioned by Dr. Marshall Hall. But 3d, A bright surface, as a mirror; 4th, The sight of water; 5th, The sound of water dropping; 6th, The idea of water, as when suggested to the patient that he shall drink;—all most indubitably induce excito-motor phenomena, as decided and distinct as the first and second causes.

Some of the spasmodic movements as well as being involuntary, have a conservative object in view, as shown in the attempts to remove water when presented, the expelling it from the lips with a violent spasmodic jerk, &c.

These are the chief physiological points contained in Dr. Laycock's admirable paper; the remaining part of it is somewhat too abstruse and metaphysical to admit of further notice here, but the whole is well worthy of attentive perusal.

22. *Animal electricity.* The highly interesting electro-physiological researches of Professor Matteucci of Pisa have recently excited considerable attention; the following are the chief facts established by his experiments:—*1st, Muscle is a better conductor of electricity than nerve, and nerve conducts better than brain; the conducting power of muscle may be taken as four times greater than that of brain or nerve.

2d. In the muscles of living animals, as well as of those recently killed, an electric current exists, which is directed from the interior of each muscle to its surface. The duration of this muscular current corresponds with that of contractility: in cold-blooded animals, therefore, it is greatest; in mammalia and birds it is very brief. Temperature has a considerable in-

* Todd and Bowman's Physiological Anatomy and Physiology of Man, Part II. Also see a good review of Matteucci's Traité des Phénomènes Electro-Physiol. des Animaux, in Med. Chir. Rev. April 1845.

fluence on the intensity of the current, a small amount of electricity, being developed in a cold medium, a larger one when the medium is moderately warm. Any circumstances which enfeeble the frogs (the animals experimented on) and derange their general nutrition, will diminish the power of the muscles to generate electricity, as they also impair the contractile force. The muscular current appears to be quite independent of the nervous system. It is uninfluenced by narcotic poisons in moderate doses, but is destroyed by large doses, such as kill the animal. The development of this muscular current seems evidently to depend on the chemical action constantly taking place as an effect of the changes accompanying nutrition; these organic changes, in short, give rise to an electric current, just as do the chemical changes attending the mutual reaction of inorganic materials, such as the reaction between a plate of metal, and an acidulated fluid in the ordinary voltaic pile. That considerable chemical changes attend the process of nutrition in muscle, seems evident when we consider the constant supply and waste of material of which it is the seat, and the evolution of sensible heat which accompanies its contraction; in this way the generation of electricity can be readily accounted for; the muscular fibre represents the metal acted on in the arrangement of the voltaic apparatus, and the arterial blood corresponds to the acidulated fluid. The surface of the muscle, which is more or less tendinous, and therefore different in structure and in function from the interior, represents the second plate of metal used in the voltaic apparatus, which does not suffer chemical action, but which only serves to form the circuit. The direction of the muscular current, therefore, from the interior to the surface of the muscle is just such as might be expected, supposing it to be due to a chemical action taking place in the interior of the muscle.

3d. Another result obtained by M. Matteucci is the proof of the existence in frogs of an electric current distinct from the muscular current; it proceeds from the feet to the head, and is peculiar to the Batrachian reptiles.*

4th. Some curious results were obtained by applying electricity in various ways upon nerves. Upon making some experiments on the sciatic nerves of rabbits, he found that upon *closing* the circuit of the *direct* electric current, or the current directed from the brain to the nerves, contractions in the muscles of the posterior limbs were produced whilst upon *opening* this circuit marked signs of pain, with contraction of the muscles of the back, and feeble contractions of the posterior limbs, were caused. Upon *closing* the circuit of the *inverse* current, or that directed from the nerves to the brain, signs of pain, contractions of the muscles of the back, and feeble ones of the posterior limbs, were produced; upon *opening* it, contractions of the posterior limbs were caused.

It will not be misplaced to notice here the marked analogy between the actions of the electrcal organ of the torpedo and those of muscular fibre, which Matteucci's interesting experiments illustrate. Both are organized to act in a particular way; the one to develop electricity without any visible change in itself; the other to contract, with a demonstrable evolution of both heat and electricity. Both will manifest their peculiar phenomena by direct irritation, or by indirect irritation through the nerves. Both are brought under the control of the will by the nerves; the section of which paralises the influence of the will over both, but does not destroy the peculiar power of either. In the electrical fish, irritation of the electrical lobe

* For an account of the experiments proving the existence and direction of this and the muscular current, see Todd and Bowman's Physiological Anatomy, vol. i. page 380.

of the brain is capable of exciting a discharge of the organ, just as irritation of a segment of the spinal cord causes contraction of the muscles supplied by it. A current of electricity transmitted through the electrical organ or its nerves, causes discharge; and a similar current sent through a muscle or its nerves, causes it to contract. All the circumstances which modify the nutrition of muscle, will similarly affect that of the electrical organ.*

23. *Nerves of the eighth pair.* Numerous observations have been lately made as to the respective functions of the glossopharyngeal, pneumogastric, and accessory nerves, by Stilling, Van Kempen, Bernard,† and Hein. Their conclusions, on the whole, agree pretty closely, though they differ on some points, both with each other, and with previous experimenters. The present state of our knowledge (incomplete though it is) regarding the probable functions of these nerves, deducible from recent and previous facts, is thus stated by Mr. Paget.‡

1st. The glossopharyngeal is chiefly the nerve of the sense of taste, and in a less degree, a nerve of common sensation.

2d. The glossopharyngeal is, according to the experiments of Müller and Hein, the motor nerve of the stylopharyngeus, and probably also of the palatoglossus. Its branches to the digastricus, stylohyoideus, and constrictors of the pharynx, appear to be sensitive ones, or else derived from the facial and accessory nerves, with which it has previously united.

3d. The pneumogastric is, from its origin, composed of both sensitive and motor fibres. But it is undecided whether it alone supplies any particular muscles, or whether, in all its muscular branches, and especially in those given off above the œsophageal, there are filaments from the accessory as well as from its own roots.

4th. The accessory nerve contains, in all its lower roots, motor fibres alone; in its upper roots, it is not improbable that there are some sensitive fibres also. It is a motor nerve of the sterno-mastoid and trapezius muscles; and very probably it gives, by its internal branch and other communications, motor fibres to the pneumogastric, from which they are subsequently distributed to some or all of the muscles of the larynx and pharynx; and, in some animals, to the muscles of the palate.

The main difficulty in assigning exactly to the pneumogastric and spinal accessory nerves their respective functions, depends on the intimate commingling of the fibres forming the uppermost roots of the accessory with those forming the lowest roots of the pneumogastric; so that it is hard to say whether some fibres belong to the one nerve or to the other: therefore, as Mr. Paget observes, before we can hope to distinguish precisely the physiological properties of these two nerves, we must learn to distinguish them (if, indeed, they are two nerves) anatomically.

24. *Anterior thoracic nerve.* Dr. Hargrave§ considers that the anterior thoracic nerve from the brachial plexus, inasmuch as it supplies the subclavius, pectoralis major and minor muscles, which muscles, he says, are especially concerned in dyspnea and orthopnea, ought to be added to the respiratory system of nerves, as laid down by Sir. C. Bell. This nerve, he states, performs a function analogous to that performed by the external inferior respiratory nerve in respiration, namely, to associate in this movement,

* Todd and Bowman, l. c. p. 336.

† An analysis of M. C. Bernard's recent Memoir is given in the Edinburgh Medical and Surgical Journal, Jan. 1845, p. 234.

‡ British and Foreign Medical Review, April 1845, p. 583.

§ Dublin Medical Press, April 16, 1845.

the muscles to which it is distributed, with the serratus magnus, the diaphragm, sternomastoid, and trapezius muscles. Dr. Hargrave, therefore, proposes to call this nerve the *anterior, inferior, external respiratory*, in reference to the aspect of the thorax to which it is distributed.

25. *Pacinian corpuscles.* The following account of these little bodies is given by Mr. Paget. "The investigations of Henle and Kölliker have proved a new and peculiar mode of peripheral termination of the nerve fibres in the little bodies, seated especially in the nerves of the fingers and toes, which were discovered, and to a certain point well described, by Pacini, of Padua, in 1830. These *Pacinian corpuscles* are found in man at all ages after the twenty-second week of fœtal life, and under all circumstances, and in many mammalia. They are most numerous on the cutaneous nerves of the hands and feet; but they occur also, sometimes, on other sensitive cerebro-spinal nerves, and on the sympathetic plexuses in the mesentery and mesocolon, and about the pancreas, where they are especially numerous in cats. In man, from 150 to 350 may be counted on a single limb; and they are chiefly abundant on the branches of the digital nerves, just penetrating the cutis, to which they are attached singly or in pairs, or sometimes in groups, by little fibro-cellular pedicles. Through the pedicle of each, a single primitive nerve-fibril passes into the corpuscle. The corpuscles are of various forms, elliptic, ovate, obovate, crescentic, or reniform; they measure (in parts of a line) from ·66 to 1·2 in length, and from ·45 to ·6 in breadth. They are semi-transparent, slightly glistening, and appear as if a central cord passed through them. Each of them is composed of from 40 to 60 very thin coats, arranged round a central canal or cavity, like so many capsules inclosed one within another; and each coat or capsule is composed of two layers of fibro-cellular tissue, an outer layer with circular, and an inner with longitudinal fibres. Between each two adjacent layers or capsules, there is an albuminous fluid; it is most abundant between the outer capsules, which are less compactly arranged than the central ones. The outermost of all the capsules in each corpuscle is connected by cellular tissue with the adjacent parts, from which also blood-vessels penetrate inwards through more than half the layers. Here and there the adjacent capsules appear connected by partial septa extending across the spaces containing the fluid, and this is especially the case at the end opposite the pedicle. The canal or cavity in the axis of each corpuscle contains a fluid like that between the capsules, and, in this fluid, a primitive nerve-fibril. The nerve-fibril, after traversing the pedicle of the corpuscle, and a conical prolongation from the end of the pedicle through the substance of the lower part of the corpuscle, enters the cavity, and at once becomes smaller, paler, and flatter. It passes along the cavity, and at or near its distal end, terminates in a knob, or by bifurcating; in no case is anything formed like the *terminal loops* of nerves, and it is very rarely that more than one nervous fibril enters a corpuscle; neither does the terminal enlargement of the nerve-fibril resemble a ganglion-corpuscle. Of the use of these bodies little can be said. It is suggested, that as their construction with alternate layers of membrane and fluid is rather like that of the electric organs of the electric ray, &c., these also may be electric organs, and, according to Pacini, the chief agents in mesmeric operations. But Henle and Kölliker could find no manifestations of free electricity in them during life. Their not occurring upon any known motor nerves, would appear to prove that they have nothing to do with motion; but their existence on many nerves of the sympathetic system, and their non-existence on many sensitive nerves, make

it probable that they are not connected with acuteness of sensation. They may be electric organs, as their peculiar suggests, but before they can be concluded to have any relation to animal magnetism, it would be advisable to prove that *that* has any relation (except in name) to physical magnetism, or any form of electricity."*

26. *Sympathetic system: use of the sympathetic nerve and its ganglia.* With regard to the function of the sympathetic system, Dr. Procter† says: "The nearest approach to a positive determination of its use that we can come to with our present limited knowledge is, that it is for the purpose of regulating the tonic contraction of the arterial system, and for *nothing else.*" He states the necessity of so important a system as the arterial, having a controlling and directing power, and observes, "that in all parts of the animal body where large and sudden supplies of blood are required at irregular periods—such as the heart, stomach, intestines, and organs of generation; there we have the ganglionic or sympathetic system very fully developed." He explains the reason why so few nerves of the sympathetic system are found accompanying the arteries of the extremities, by the fact that the parts to which these vessels are distributed do not require the same large, sudden, and irregular supplies of blood as do the several organs and viscera of the body—[and yet the condition of a limb in full action compared with its condition after a long rest, differs as much in regard to the quantity of blood circulating through it, as does that of an organ in full secretion compared with that of the same organ in a quiescent state, so that Dr. Procter's reason for the comparative absence of sympathetic fibres accompanying the arteries of the limbs, does not explain the circumstance sufficiently.]

27. *Splanchnic nerves.* M. Bourgery,‡ in a late memoir considers that the splanchnic system of nerves consist of five parts. 1st. Of some visceral and organic nerves, the fundamental part of the splanchnic nervous system. 2d. Of ganglionic portions, which are considered as the general centres of excitement and of harmonization of that group of organs, and usually, as functional auxiliaries to each other. 3d. Of *extra-visceral* plexuses, or chains of communication between the different organs of the same group, between these and the various ganglionic centres, and between these various centres themselves. 4th. Of the two longitudinal chains of communication with the central extremity of the nerves, or properly the two cords parallel with the cerebro-spinal axis, known under the name of the great sympathetic. 5th. The last part of the splanchnic nervous system consists of anastomoses of the ganglionic nerves with the peripheral extremities of the cerebro-spinal nerves. M. Bourgery also mentions having observed in great abundance the nerves of synovial and serous membranes, and states also that he has observed ganglia and gray nervous matter on certain parts of the cerebro-spinal nerves, especially the trigemini and pneumogastric nerves, which offers some explanation for the similarity in function between these nerves and the great sympathetic observed by physiologists.

28. *Union of divided extremities of nerves.* The possibility of the divided extremities of two nerves of totally different functions being made to unite with each other has been again advanced by M. Tavignot.§ The conclusions he has arrived at coincide with the observations previously made

* Report on Anatomy and Physiology, British and Foreign Medical Review, April 1845, p. 574.

† Medic. Chir. Rev. Jan. 1845, p. 162.

‡ Gazette Médicale, 12 Avril, 1845, p. 236.

§ Ibid. 19 Janvier, 1845, p. 28.

by M. Flourens, though they are opposed to the results obtained by Dr. Bidder,* who experimented on the lingual and hypoglossal nerves, and was led to the conclusion that such an union does not take place. M. Tavignot considered that since any nerve which has been divided may have its continuity and its functions completely restored by keeping its divided extremities in apposition for some time, so also it might be possible that the divided extremities of nerves of different functions might be induced to unite, and that the function of each nerve might thus be restored. From some experiments which he made on this subject he found:—1st. That if two adjoining nervous cords of different functions be included together in a single ligature so as to affect their simultaneous division, there is shortly developed between the four extremities a kind of nervous ganglion which is common to each of them, and in which the fibres of the two nerves and their functions seem confounded; and 2d. That if two adjoining nerves of different functions be divided, and the upper end of one be adapted to the lower end of the other and kept in apposition, the formation of a new nerve preserving the functions of the old one is effected. [The latter of these conclusions is so opposed to the results of Dr. Bidder's experiments, and so far from being in conformity with the laws by which the functions of the nervous system seem governed, that further observations are requisite before its probability can be admitted.]

29. *Re-establishment of sensibility in autoplastic flaps.* Some curious observations have been offered by M. Jobert de Lamballe, which seem to show that the sensibility of flaps in autoplastic operations is restored through the medium of blood-vessels, and not through that of demonstrable nerve-fibres. The following are his observations:†—1st. Immediately after autoplastic operations the sensibility of the flap diminishes or disappears: this is in direct relation with the loss of blood. 2d. Until the section of the pedicle some degree of sensibility is retained. 3d. At the expiration of a certain period after this section, vascularity and sensibility reappear in the flap simultaneously, and increase in an equal ratio. 4th. In many cases the vascularity of the flap becomes considerable, and its sensibility is then increased in a proportional degree. Anatomical investigation has furnished the following facts:—1st. The autoplastic flaps after the section of the pedicle, are isolated from the rest of the system by a cicatricial tissue, 2d. There exist as means of communication between the flaps and the rest of the organization, only those vessels which traverse the tissue of the cicatrix; nervous filaments are never seen in this new formation. 3d. The nerves which originally existed in the flap, waste and eventually disappear. 4th. The nerves of the part surrounding the flap stop at its borders; sometimes they terminate abruptly in a kind of enlargement of the neurilema, at others they are lost in the tissue of the cicatrix, without its ever being possible to trace them into the flap.

30. *Functions of the nervous system.* Some curious views regarding the functions of the nervous system have recently been advanced by Natansen.‡ He considers that each nerve of sensation is composed of several kinds of nerves, each of which has its own peculiar function. Thus the nerves of touch would comprise those which perceive temperature, others which perceive the resistance of bodies, and lastly, others possessing the property of touch, properly so called. In proof, Natansen instances the fact, that either

* See Paget's Report, January 1844.

† London Medical Gazette, May 16, 1845, page 130.

‡ Gazette Médicale, Janvier 4, 1845, p. 9.

of these faculties may be temporarily lost without the other two being so; thus, when the arm has been "asleep," and sensibility is returning in it, the hand first perceives temperature, then the resistance of bodies, and it is only after some time that the faculty of touch properly so called can be exercised; in the lower extremities the contrary takes place, the sense of touch first returns, then we experience a sensation of pricking followed by the perception of temperature, whilst the faculty of appreciating the resistance of bodies returns last. With regard to the optic nerve, he admits three kinds of nerves: those of red, of blue, and of yellow light, which are the bases of all other colours. It is not alone the optic nerves which admit of being impressed by light,—light may also act upon the nerves of the eyelids, not so as to produce the phenomena of vision, but so as to excite a sense of pricking; in proof of this M. Natansen states, that he has often observed in blind individuals, even where the globe of the eye has been lost, that light has occasioned to them a painful sensation almost amounting to "photophoby." He analyses in the same manner the senses of taste, of touch, &c. and considers that they all confirm his statement, that all nerves of sensation are not simple, but are composed of several different kinds of nerves, to each of which belongs a peculiar function different to that of the others. He ventures also to explain the varieties of the intellectual faculties in the same way.

31. *Relative weight of the different portions of the brain.* M. Bourgery* finds that the mean weight of the encephalon, or central nervous mass being 20393·5 grains troy, the cerebral hemispheres stand for 16940·46 grains of that quantity, the cerebellum for 2176·7 grs., the cephalic prolongation of the cerebro-spinal axis for 1312·2 grs., of which the optic thalami and corpora striata take 879·9 grs.; the medulla oblongata, with the pons varolii, 432·2 grs., and the spinal cord 710·1 grains. Hence, in man, the cerebral hemispheres include a nervous mass which is *four* times that of all the rest of the cerebro-spinal mass, *nine* times that of the cerebellum, *thirteen* times that of the cephalic stem of the spinal cord, and *twenty-four* times that of the spinal cord itself.

32. *Eye. Action of the oblique muscles.* Dr. George Johnson† has performed some experiments to determine the action of the oblique muscles of the eye, and has obtained results similar to those arrived at by Volkman‡ and others, proving the truth of Hunter's opinion, that these muscles rotate the eyeball on its antero-posterior axis,§ and so keep the eye steadily fixed on an object we are regarding, during certain movements of the head, as from shoulder to shoulder, (the effects of which are not corrected by the recti muscles), and thus enable the image of the object to be kept on the same point of the retina, and not be allowed to move over its surface, which it would do, during these movements of the head, were there no oblique muscles to counteract this tendency. In Dr. Johnson's experiments, a dog was killed by the injection of air into a vein, and immediately the inferior oblique muscle was exposed by dissecting off the conjunctiva without in any way interfering with the surrounding parts; by means of two fine wires, a slight electric current was then directed through the muscle. The effect was a rapid rotation of the eye upon its antero-posterior axis, so that a piece

* Med. Gazette, Jan. 3, 1845, p. 462.

† Cyclopædia of Anatomy and Physiology—*Art.* Orbit, p. 791.

‡ Müller's Archiv, 1840-1-2. See also the pathological evidence by Szokalski, and other confirmatory facts in Longet, Du Système Nerveux, tome ii, p. 396.

§ Palmer's edition of Hunter's works, vol. iv. p. 274.

of paper placed at the outer margin of the cornea passed downwards and then inwards towards the nose. The superior oblique was then exposed at the back of the orbit, and was treated in the same manner. The rotatory movement produced was precisely the reverse of the former; the paper at the outer margin of the cornea passed upwards, and then inwards towards the nose. In the case of the superior oblique the movement was less extensive, the irritability of the muscle being less, perhaps from the delay in exposing it and from some slight injury inflicted on it in so doing. There could be no doubt as to the direction of the movement in both cases; there was not the slightest appearance of elevation, depression, abduction, or adduction, of the cornea. The experiment was subsequently repeated on another dog with precisely the same result.

33. *Muscæ volitantes.* Dr. Jago* considers that those minute globular particles, which may always be seen in the healthy eye by looking through a card with a small aperture, (and which, when in great abundance, and visible without looking through the aperture in a card, are called muscæ volitantes), are seated in the vitreous humour, and constitute a natural and essential part of this fluid. That they exist in a fluid is manifest from their floating and moving about in the interior of the eye; thus, when we raise the eye to look at an object, they evidently continue to move in the same direction even after the eye is stopped; and then, after balancing a moment, commence to descend again to their usual places. That they are near to the retina and far from the cornea seems proved by this experiment: when a card (through a small aperture in which we are looking) is moved across the axis of the eye in any direction, these little particles move in the same direction, but through a less space than that travelled by the card, or by a tear which we can see. These two circumstances seem to point to the vitreous humour as the seat of muscæ volitantes.

§ VII.—*Generation.*

34. *Analogy of menstruation with the "rut" of animals, &c.* Few subjects have had so much attention directed towards them, or have been so fully investigated of late years as those which have reference to the phenomena of menstruation, the maturation and discharge of ova, and the formation of corpora lutea. All have received considerable elucidation, and the result has been that many highly interesting and important points have been ascertained concerning each, and what was before considered strange and anomalous, is now shown to be all order and harmony. Thus, menstruation which until of late was almost universally regarded as peculiar to the human female, is now proved beyond doubt to be analogous in all essential particulars to the phenomena attending the process of *heat* or *rut* in animals. The investigations of many British and continental physiologists have established the truth of this analogy almost beyond question. Among the most recent labourers on the subject of menstruation is Mr. Girdwood, who in a capital paper† has summed together most of the facts establishing the above-mentioned analogy, and has, moreover, strengthened these facts by the results of several original experiments. He draws attention to the following conclusions, (the first two of which, however, have been also well established by the researches of Bischoff, Raciborski, and other recent inquirers.) 1st. The catamenia appear in lower animals as well as in the human female, and whilst the discharge is characterized in

* London Med. Gazette, May 16, 1845. † Lancet, December 7-14, 1844.

them as in her, by a periodicity peculiar to each separate genus, it is (at least in the higher orders of mammals) equally sanguineous in them as it is in woman. From observations on the dog, rabbit, cow, and mare, Mr. Girdwood proves that the occurrence of a periodic discharge in them attends the phenomena of heat, and the discharge microscopically and chemically bears a more or less close resemblance to that of the human female, and he observes that in passing up through the series of animated beings, it would appear that the nearer we approach man, the more the catamenial discharge approximates in character that of our own species. It appears in all to consist of a profuse periodic flow of the usual mucous secretion of the organs of generation, with, in the higher genera of animals, the super-addition generally, of more or less blood diffused in the secretion and from this its diffusion deprived of its usual amount of coagulation. 2d. In woman, and in the females of all animals in which the periodic discharge is apparent, the discharge is indicative of the maturation of an ovum, and of its being on the point of elimination from the ovary; and the capability for impregnation is, during menstruation, at its acme. This corresponds with the observations of Bischoff, Pouchet, Raciborski, &c., and is now a generally adopted principle, for although on account of the minute size of the human ovum and the rare opportunities afforded of examining the bodies of women who have died during the menstrual period, it is difficult to prove the question beyond doubt by the discovery of ova, yet sufficient observations have been made to render it pretty certain that the above observation is correct, so far as the human female is concerned. With regard to animals, numerous observations and experiments, especially those by Bischoff and Raciborski have rendered it quite certain that at every period of heat one or more ova are matured and discharged from the ovary, and this moreover quite independent of sexual intercourse. The statements of these eminent physiologists are founded on the surest of all evidence, the actual detection of ova in the fallopian tubes of animals in whom sexual intercourse had not taken place; thus Bischoff found in a lamb killed a few hours after becoming in rut for the first time, (and in whom coition had not been effected,) a ruptured Graafian vesicle in the right ovary, and an ovum in the corresponding fallopian tube. Again, in a bitch two days after becoming in heat, and apparently inclined to admit the male (which it was prevented from doing,) Bischoff extirpated the left ovary and fallopian tube and closed the wound by suture; no Graafian vesicle in this ovary had burst, but four were extremely turgid. Five days afterwards the bitch was killed; four large corpora lutea were found in the right ovary, and four ova in the corresponding fallopian tube. From this it appears quite certain as Bischoff concludes that during the rut of animals, ova became detached from the ovary and enter the fallopian tube where they perish, unless sexual intercourse coincidently occurs, in which case the ova in all probability become impregnated. The same may be considered to hold good in the human female.* Premature appearance of the catamenia seems to depend according to Raciborski on the precocious

* For an account of Bischoff's and Raciborski's observations on the periodical discharge of ova and on menstruation, see a review of their labours in the British and Foreign Medical Review, Jan. 1845; also the translation of Bischoff's last work, by Mr. Henry Smith, in the London Medical Gazette, Jan. 3, 17, &c. 1845. These researches do not all strictly belong to the contributions of the last six months, yet they are noticed here, because for the most part they have only become generally known in England during the present year, and are now being discussed in our journals.

development of the ova; a circumstance in favour of this opinion is the invariable coincidence of development of the mammæ and external genital organs with the occurrence of the hemorrhage, in cases of premature menstruation. There are still wanting observations to show what is the exact purpose served by the periodical discharge of a sanguineous fluid attending the maturation and discharge of ova; numerous ingenious suggestions have been made, but the right one does not seem yet to have been hit upon. There seems no doubt, but that all the phenomena of menstruation are primarily dependent on the ovaries, which act sympathetically on the uterus, as well as on other organs. A main argument which has been advanced against menstruation in the human female being a process identical with the rut of animals, is the disinclination to sexual intercourse evinced by woman during the menstrual period, whilst it is only during the period of rut that animals will admit the male; but this Bischoff (as also Mr. Girdwood) considers to be the result of habit and the natural delicacy of the sex, rather than of actual disrelish; and it is most probable that in woman as well as in the females of animals, the desire for sexual intercourse is greatest at the menstrual period or heat, especially towards the decline of the discharge; at which latter period, from observations on animals, it is proved that the ova are usually discharged; bitches are generally observed to be languid and to refuse the male during the first few days of heat, but after this they become lively and readily admit of being lined, so, analogous to this is the ailment of the human female during the early part of each menstrual period, and previous to the discharge becoming fully established. 3d. A third conclusion arrived at by Mr. Girdwood in the above-mentioned paper, is that the periodicity in the maturation of ova and of the attendant phenomena of menstruation is applied to most of the leading phenomena of nature which are dependent upon heat, and that like these it is influenced by seasons. This is ingenious, but wants more extended observations for its establishment.

35. *Discharge of matured ova, &c.* Besides proving that at each period of heat in animals ova are regularly discharged, whether sexual intercourse coincidently takes place or not, Bischoff has added some curious observations, showing that the bursting of the Graafian follicles, and consequent discharge of ova, is entirely independent of sexual orgasm, or of the influence of spermatozoa, thus: (*a*) Coitus may take place, and examination of the ovaries, six, eighteen, or twenty hours afterwards, prove that no ovum has escaped, although spermatozoa may have reached the ovaries. (*b*) Examination immediately after coitus may detect ova which have advanced two or more inches along the fallopian tube, to have done which they must have started some considerable time before the act of coition. Bischoff considers it to be immaterial at what part of the fallopian tube the spermatozoa and ovum come in contact; so that they meet before the ovum has reached the uterus, impregnation is sure to take place. He states that he has clearly traced live spermatozoa up to the ovaries; this statement, and the inference he deduces from it, that fecundation of the ovum may take place at any part of the fallopian tube, is called in question by M. Pouchet,* who has recently offered a table showing hourly the progress and condition of the spermatic fluid in the generative apparatus of the mammiferous female. His experiments were chiefly made on rabbits. From the 16th to the 25th hour after copulation, live spermatozoa were constantly found in the vagina

* Bulletin des Académies, Janvier 1845, p. 64.

and uterine horns. Even to the 21st or 23d hour these animalcules [?] continued very active, but shortly after that, they lost their vivacity, and died towards the 25th hour; so that nothing but broken-up tail-less spermatozoa could be seen. He was never able to see live spermatozoa reach more than a very short distance up the uterine extremity of the fallopian tube; and he considers the observations of Bischoff and Wagner, who had found live spermatozoa on the ovaries, to be erroneous. According to his own view, it is in the uterus alone, or probably also at the mouth of the fallopian tube, that impregnation of the ovum can be effected. [To this it can only be said, that the positive evidence of Bischoff ought to receive more consideration than the negative statement of Pouchet, and that if the latter be correct in his views, it will be difficult to account for the mode in which extra-uterine or ovarian impregnation takes place, whilst the observations of Bischoff explain it at once.*]

36. *Corpora lutea.* The great importance, in a medico-legal point of view, of determining the true nature of the "corpus luteum," and of ascertaining how far its existence could be safely relied on as proof that sexual intercourse and consequent conception had taken place, has of late years led to numerous investigations on the subject. Although the descriptions of corpora lutea given by most observers differ somewhat from each other, yet, on the whole, they so far correspond that, generally speaking, there can be no great difficulty in pronouncing, whether or not a given substance found in an ovary be a true corpus luteum; such a one, at least, as is formed when a matured and discharged ovum has been impregnated. From Dr. Ritchie's observations,† it would seem that one cause of the discrepant accounts given of the corpora lutea, may be found in the varying characters which these structures occasionally present; thus, concerning the seat of the yellow deposit, about which there has been so much dispute, Dr. Ritchie states that it may be situated either on the exterior of the ruptured Graafian follicle, between its layers, or within its interior; he considers the yellow mass to be an hypertrophy of the granular layer lining the internal membrane of the follicle. Besides varying in seat, Dr. Ritchie states that the corpora lutea also vary to a considerable degree in aspect and character, some being of a white colour (*corpora albida*), and either of a soft fatty aspect, or dense and shining; others (*corpora cephaloidea*) are yellowish, and of a brain-like character; and another class (*corpora rubra*) which are at first similar to the last, although they are plumper, more vascular, better developed, and the granular matter of which they are composed susbequently becomes of a decided red colour.‡ There has always been considerable difficulty in deciding the question, whether or not the presence of a so-called true corpus luteum could be relied on as a proof of conception. Many have considered it to be an infallible test, and have based their evidence upon it in medico-legal inquiries; but some late observations of Bischoff and Raciborski seemed to prove, that not merely as a result of conception, but at each menstrual period, the discharge of an ovum was followed by the formation of a corpus luteum; in this conclusion, however, there is no doubt they were mistaken, and by the following recent observations, Raciborski admits that they were so, although Bischoff still maintains that what he has observed to take place in animals, namely, the formation

* The various experiments of Professor Bischoff are fully detailed in the translation by Mr. H. Smith, in the Medical Gazette, January 3, 17, &c.

† Review of Dr. Carpenter's Physiology, Medico-Chirurgical Review, April 1845, p. 340.

‡ L. c. p. 340.

of a true corpus luteum after each period of heat, takes place in the human female also; this offers a good instance of the danger of drawing conclusions from analogy alone, for although it appears certain that a corpus luteum is formed at each period of heat in animals, which is undistinguishable from that formed after conception, yet any one who has had frequent opportunities of examining human ovaries will be aware how seldom true corpora lutea are found in them, and that they only exist in cases of pregnancy, or where delivery has but recently taken place; whereas, if, as Bischoff supposes, a corpus luteum is found at each menstrual period, one ought to find several in almost all the ovaries of those who die during the age in which the habit of menstruation continues. The clots of blood in various stages of discoloration (according to their age), so commonly found in ovaries, although they indicate a ruptured Graafian vesicle and the discharge of a matured ovum, yet they bear no resemblance or analogy to the yellow mass observed when the discharged ovum has become impregnated.

The following conclusions of M. Raciborski* are especially important since they correct his previous statement that a corpus luteum is formed at each menstrual period in the human ovary, and that its existence cannot be regarded as a proof of conception. His present views confirm the observations of Deschamps.†

1. The corpus luteum is the result of an hypertrophy of the granular layer lining the internal or proper membrane of the Graafian follicle; the only difference between the corpus luteum and this granular layer is that the granulations of the former are larger and more numerous, and contain many more yellow oil-globules.‡ 2. The transformation of the granular layer into a corpus luteum commences as soon as the ovum is matured and the follicle ready to discharge it. 3. As soon as the Graafian follicle is ruptured, the process of transformation becomes more active; but in the human female the degree of activity varies greatly, according as the expulsion of the ovum is spontaneous, as during a menstrual period, or coincides with sexual intercourse, and is followed by conception. In animals this difference does not exist; whether expulsion of the ovum has been followed by coition or not, a true corpus luteum forms. In the human female, however, if expulsion of the ovum has not been followed by conception (as occurs at each menstrual period) the granulations certainly increase, but their activity of growth stops short when they have formed a thin, yellowish membrane, which lines the inner tunic of the vesicle, and is found to contain within it a clot of blood, more or less altered, according to the period at which it is examined. If, on the contrary, conception coincides with expulsion of an ovum, the granulations rapidly increase in size and number, and shortly form a yellow mass, quite filling the cavity of the follicle, or leaving at the most a white fibrinous-looking streak in the centre, indicating the existence of a former cavity. 4. In all cases this corpus luteum remains of its full size to the end of pregnancy; but after delivery it rapidly disappears, so that at the end of three months nothing but a small and almost colourless spot will remain. 5. It results from the above that by simple inspection, one can readily distinguish cases of simple spontaneous

* Bulletin de l'Académie Royale de Médecine, November 15-30, 1844, p. 114. A translation of them is given in the Edinburgh Medical and Surgical Journal, April 1845, p. 514.

† Gazette Médicale, July 20, 1844.

‡ In this view Raciborski is confirmed by Pouchet, who considers the corpus luteum to be due to an increased development of the membrana propria of the Graafian follicle. Comptes Rendus, 10 Mars, 1845, p. 608.

expulsion of ova from those in which the expulsion has been followed by conception.

37. *Structure of the uterus.* The following observations on the arrangement of the muscular fibres of the uterus, by M. Jobert de Lamballe, are extracted from the American Journal of Medical Sciences.*

The fibres of the single muscle which forms the uterus are arranged in layers, and present the following direction: the longitudinal superficial fibres, which may be called median from their position, are seldom seen on the anterior surface, but are constantly met with on the posterior, where they constitute two superincumbent layers. 1st. Posteriorly they begin at the fundus of the uterus, and end at the uterine extremity of the vagina, to which they become attached, with the exception of some few that terminate on the neck of the uterus; they adhere by one surface to the peritoneum, by the other to the oblique fibres. 2. The anterior superficial fibres do not pass along the entire extent of the uterine parietes, but cross each other before they arrive at the round ligament of the opposite side. Some contribute to form this ligament, whereas others pass behind, and terminate on the lateral regions where they cross those of the posterior region. 3. There are other superficial fibres, only evident during pregnancy, which are destined to the fallopian tubes, and to the ovarian ligaments. Some originate at the fundus of the uterus, unite to those which contribute to form the fallopian tubes, and pass on to the anterior part of the ovarian ligament; others, more numerous, originate from the posterior surface of the fundus, and pass on to the same ligament. Lastly, a few transverse fibres from the posterior surface, form its inferior part. The numerous fibres which pass on to the fallopian tubes originate at the fundus of the uterus, and form a thick fasciculus, which divides into two secondary fasciculi, destined one to the ovarian ligament, the other, more voluminous, to the fallopian tube. Some fibres separate from the common fasciculus, and lose themselves in the cellular tissue which separates the fallopian tubes from the round ligament. The deep fibres are very visible when the uterus has undergone rather lengthened boiling. They all evidently present a semicircular direction, are rather oblique, and only differ from those above described by their small size, and by their belonging exclusively to the body and to the neck of the uterus. They cross each other on the median line anteriorly and posteriorly, as also on the sides, so as to produce a kind of network. Their thickness varies as they approximate the internal surface of the uterus, where they appear to describe circles exterior to the internal membrane. There are annular fibres along the fallopian tubes, which do not entirely encircle it, and are deep seated. Lastly, the blood-vessels are encircled by fibres similar to the deep muscular layer which surrounds the intestinal canal. The uterine neck is formed by fibres which constitute semicircles, and decussate without mingling. The muscular fibres of the vagina are posteriorly continuous with the longitudinal fibres of the uterus, but anteriorly they terminate abruptly, at the junction of the vagina with the uterus.

In order to empty the uterus of its contents, the longitudinal fibres tend to diminish the length of the uterus, whilst the semicircular ones diminish its cavity in every other direction.

38. *Structure of the human placenta.* In giving an abstract of the following observations on the structure of the placenta by Mr. Goodsir, it will

* January 1845, p. 181.

render the subject more intelligible to divide it into three heads, as adopted in the original memoir:

1st. Each placental tuft consists of a trunk, of primary branches, and of secondary branches or villi. Each villus is made up of the following parts: (*a*) An *external* fine transparent membrane. This membrane is common to the whole tuft, passing from one villus to another, and closely covering the free surface of each. (*b*) A layer of flattened nucleated cells beneath this membrane, (*external cells* of the villus,) here and there these cells are grouped together into heaps, in the centre of which is a germinal spot, which is engaged in the constant formation of new cells.* It seems probable that the internal aspect of this layer of cells is lined by a fine membrane, as in the case of the intestinal epithelium. (*c*) Beneath these structures, and immediately surrounding the blood-vessels within the villus, is another still finer and more transparent, but firm and strong membrane, (*internal membrane* of the villus.) This is readily separable from the layer of cells described: the space between them is probably occupied by a peculiar fluid. (*d*) Within this membrane are the blood-vessels of the villus, consisting of one or sometimes two vessels, which form a simple or contorted loop occupying the cavity of the villus; they are derived from the umbilical arteries and veins; they differ from capillaries in their large size, and from arteries and veins in preserving the same mean diameter throughout: one such vessel occasionally passes from one to two or more villi, forming a loop in each, before it becomes continuous with a vein. (*e*) Between these vessels and the internal membrane are some other cells, nucleated and highly transparent, called the *internal cells* of the villus.

2d. (*a*) The substance of each tuft of the chorion is made up of nucleated cells of various sizes, containing a granular fluid. (*b*) The surface of the tuft is covered by a fine membrane, which consists of flattened cells united by their edges. (*c*) The free extremity of each villus of the tuft is bulbous, and consists of transparent cells arranged round a central germinal spot. These groups of cells are the active agents by which the villi grow. (*d*) As gestation advances, and the allantois becomes applied to the internal surface of the chorion, blood-vessels become developed within the villi, which then communicate with the umbilical vessels. (*e*) Thus, then, the villi of the chorion form the internal (or fœtal) portion of the placental villi, previously described,—the loops of vessels, internal cells, and internal membrane of which have their origin in the villi of the chorion.

3d. (*a*) When impregnation has taken place, the mucous membrane of the uterus becomes greatly developed; the epithelial or cellular secretion of its follicles becomes augmented, and the vascular network occupying the outer follicular spaces becomes increased in size and extent. By this means a new layer or membrane is produced, the *membrana decidua*, which consists of two portions, the thickened vascular mucous membrane and the non-vascular cellular substance secreted by the follicles. The former constitutes at a later period the *decidua vera*, the latter the *decidua reflexa*. (*b*) As the (impregnated) ovum reaches the uterus, the developed mucous membrane or decidua begins to secrete, the os uteri becomes plugged up with a portion of the secretion, and the cavity of the uterus is filled with fluid—around the ovum this secretion consists of spherical nucleated cells, which possess the power of undergoing further development after being detached from the germinal spots or membrane of the secreting organ. These cells

* Vide nutritive centres.

around the chorion of the ovum come to constitute the *decidua reflexa*. (*c*) Thus the tufts of the chorion are imbedded in a mass of nucleated cells, which cells are constantly being secreted from the follicles of the uterus, and which in all probability contain within them as they become fully developed, the nutritive materials, which the absorbing cells of the villi of the chorion are constantly taking up for the nourishment of the ovum. This cellular secretion seems thus to be to the ovum of the mammal what the albuminous fluid is to the ova of oviparous animals. (*d*) As the ovum increases in size, the amount of nutriment absorbed by the cells alone, is not sufficient for its wants; the allantois becomes applied to the inner surface of the chorion, and blood-vessels become developed within the tufts and villi. The vessels of the decidua vera at the same time enlarge and assume the appearance of sinuses encroaching on the space formerly occupied by the cellular substance of the decidua reflexa, in the midst of which the villi of the chorion are imbedded. Thus the lining membrane of the vascular system of the mother becomes the *external membrane* surrounding the villi of the placenta. It lines the whole placental cavity, passing from tuft to tuft and villus to villus, forming in this way threads and bands of venous membrane, which are tubular and filled with cells. These cells are continuous in the one direction with the *external cells* of the placental villi, and in the other with the gelatinous cellular substance constituting the *parietal portion* of the placental decidua, which is in connexion with the wall of the uterus. The *central portion* of the placental decidua consist of the external cells and external membrane of the placental villi.

It appears from the above:

1st. That the placental tufts and villi are made up on the one hand by the tufts and villi of the chorion, comprising umbilical vessels, internal membrane, and internal cells; and on the other hand by the lining membrane of the maternal vascular system, with a layer of cells beneath it, comprising the external membrane and external cells—the first portion is peculiar to the fœtus, the latter to the mother.

2d. These external cells are the remains of the decidua reflexa; they are still continuous with the cellular substance of the parietal placenta, by means of the cells filling the tubular threads of venous membrane.

3d. The function of the external cells is to secrete from the maternal blood (from which they are separated only by the external membrane) the materials of nutrition destined for the fœtus; this function is analogous to the digestive one performed by the intestinal mucous membrane in extra-uterine life.

4th. The function of the internal cells or those belonging to the fœtus is to absorb through the internal membrane the materials secreted from the maternal blood by the external cells. This matter is then taken up by the umbilical vessels and carried away for the nourishment of the fœtus. These internal cells perform a function analogous to that effected in extra-uterine life by the absorbing chyle-cells of the intestinal villi.

5th. Hence the placenta discharges not only the functions of a lung, but also of an intestinal canal to the fœtus.*

39. *Respiration of the embryo.* MM. Baudrimont and Martin St. Ange having continued their researches on the absorption of oxygen by ova during their embryonic development, found in all their experiments on the eggs of hens, turkeys, adders, lizards, and many species of batrachians, that

* Anatomical and Pathological Researches, by John and H. D. S. Goodsir.

there occurred in each a true respiratory process, consisting in the absorption of oxygen, and the exhalation of carbonic acid, nitrogen, and watery vapour.*

[It would appear that this process is essential to the development of the embryo. The exhalation of carbonic acid and watery vapour is, no doubt, the result of combustion of carbon and hydrogen by means of the absorbed oxygen; the effect of which will be the generation of a certain amount of heat, independent of that afforded by the mother in the case of birds, and will in part account for the elevation of temperature above that of the surrounding air, observed in some reptiles during incubation.]†

40. *Meconic membrane.* Dr. Ridge,‡ in a recent work, describes the existence, during fœtal life, of a membranous sac, lining the mucous membrane of the whole alimentary canal, and serving for the "envelopment and security of the meconium." He gives it the name of "membrana meconii." What purpose could be served by such a membrane, which is not adequately performed by the intestinal mucus, it is difficult to conceive. Most probably a compact layer of such mucus investing a portion of meconium has deceived Dr. Ridge into the belief of having discovered a new tissue. Not one alone, however, for he mentions a "rete vasculare," which he describes as a network of the most delicate blood-vessels," situated between the membrana meconii and the true mucous membrane. The existence of this vascular network, and consequently of the office attributed to it, of maintaining the nutrition of the membrana meconii, is, we must confess, as improbable as the existence of the membrane itself.

§ VIII.—*Miscellaneous Subjects.*

41. *Effects of extirpation of the spleen and thyroid gland.* From M. Bardeleben's experiments§ it results, that the animals which survive the extirpation of the spleen appear speedily to recover their health, and present no difference from those which have not undergone this operation. He never remarked that they were more voracious than other animals, though it has been said that voracity is generally produced. In no case was the organ regenerated, though Meyer of Bonn has observed this. After removal of the thyroid the health was not sensibly affected. In one rabbit, the venereal appetite was considerably augmented; a circumstance worthy of remark, seeing that it has often been asserted, that removal of that gland abolished the venereal appetite. The animal deprived of both spleen and thyroid gland presented no change in any function. This fact is in opposition with the opinion of Tiedemann, that the lymphatic glands and thyroid body performed the functions of the spleen when that organ was extirpated. Finally, some physiologists have advanced the opinion that extirpation of the spleen produced augmentation of the venereal appetite, but abolition of the procreative faculty. M. Bardeleben satisfied himself of the incorrectness of this opinion, by breeding with dogs which had both spleen and thyroid extirpated.

Professor Mayer of Bonn,‖ has offered further proof that after extirpation of the spleen the small lymphatic glands in connexion with the splenic

* Bulletin des Académies, Janvier 1845, p. 63.

† See Mr. Paget's Report, April 1845. P. 592 of British and Foreign Medical Review.

‡ Physiology of the Uterus, Placenta, Fœtus, &c. 1845, p. 52 et seq.

§ Edinburgh Medical and Surgical Journal, Jan. 1845.

‖ Medical Times, March 29, 1845, p. 550.

artery become enlarged, coalesce, and, in no long time, form masses of considerable size, which doubtless perform to a certain extent the functions of the extirpated organ. In ducks and hens ten months sufficed for the production of a glandular mass equal in size to the original spleen. This speedy formation of a new organ discharging the functions of a spleen, will account in part for the trifling subsequent derangement resulting from its extirpation.

42. *Parasitic animalcules in the sebaceous follicles.* M. Gruby gives an account of these animalcules, the existence of which was discovered by the late M. Simon.*

In man this parasitic insect is met with most commonly in the sebaceous glands of the skin of the nose. It usually occupies the excretory duct of the gland, and when there is a hair, the insect surrounds it. Its head is directed towards the base of the gland, its tail towards the surface of the skin, its feet are applied to the internal wall of the excretory duct. The duct is usually dilated at the part where the animal is lodged. In young persons there are never more than two or four parasites in each gland, but in persons of twenty-five and upwards, there are from four to eight. In still older individuals there may be from ten to twenty, in which case almost all the sebaceous glands are affected. They are common to most persons whether in good health or in disease.

It is only when in large numbers in the glands that any irritation results, and then they produce that red, elevated, and tender spot at the orifice of the duct so commonly seen about the nose. These parasites exist abundantly in dogs, and produce a very formidable and contagious disease. M. Gruby gives an anatomical and zoological description of these animalcules.†

43. *Influence of hot air on animal life.* The results of some late experiments by Magendie,‡ prove that no animal can endure the temperature of its body being increased more than 9° F. beyond its natural state. Thus two rabbits, the natural temperature of whose body is 102° F. were severally placed in stoves, the one heated to a temperature of 140°, the other to that of 212°. After a short time the temperature of both rabbits rose to 111° F., that which was in the hottest stove being the first to attain that temperature. He repeated the same experiment many times on different animals, but in no case did the temperature of the animal increase more than nine degrees. The same occurred with birds. Having attained this increase of temperature, the animals and birds in every case soon died; their arterial blood was found dark, like venous blood, did not redden on exposure to air, and had lost its property of coagulating.

The increase of temperature seemed to be attained chiefly through the medium of the skin, for when the head of an animal was confined in the heated stove, so that it breathed the hot air, the elevation of temperature was much less in an equal period of time than when the body was exposed to the heated air, and the head was out of the stove. Thus a dog, whose body was within the stove, but the head out, lived only twenty-two minutes; but another, whose head was within the heated stove, and the body out, lived forty minutes.

* Muller's Archives, June 1842.

† Comptes Rendus, Mars 3, 1845, p. 569 et seq. A very elaborate description of them is given by Mr. Erasmus Wilson, in the Philosophical Transactions, 1844, page 305; he applies to them the name of entozoon folliculorum.

‡ American Journal of Medical Sciences, January 1845, p. 183.

An animal placed in a dry heated stove loses weight, but the amount lost is proportioned to the length of time the animal remains within the stove, not to the degree of heat, and the loss is no greater at a temperature of 212° than at one of 140° in an equal space of time. In stoves heated with moist air on the other hand, Magendie found that instead of losing they often gained weight. Death occurred much sooner in these stoves than in the ones heated with dry air.

[The results of these experiments are especially interesting when compared with the observations made by M. Constantine James regarding the effects on the body of the hot moist air of the baths or stoves of Nero, at Pozzuoli.* The greatest amount of heat which M. James could endure in the hot moist air of the passage leading to the springs was 122° F.: when he had arrived at that part of the passage where the atmosphere had attained this temperature, he was utterly exhausted, and had nearly lost his consciousness. He was almost suffocated at a temperature of 112° F., whereas, in the caves of Lestaccio, in which the heated air is dry, he was enabled to bear without much discomfort a temperature of 176° F.]

44. *Anatomy and use of the thymus gland.* On this subject we are fortunate in being able to refer to some recent researches by Mr. Simon,† the value and importance of which has attained for them the high honour of gaining the first Astley Cooper prize. In the endeavour to place before our readers a brief abstract of this work, we shall omit the author's very concise and accurate history of the labours of former writers, and proceed at once to the discussion of the original portion of his labours.

The first appearance presented by the gland, as observed in the fœtal calf, is that of a simple tube lying along the carotid vessels, and exhibiting faint traces of commencing areolar tissue. The contents of the tube at this time are granular, but do not contain any distinctly formed corpuscles. Mr. Simon suspected that this tube was not the primary condition of the organ, but that it might exist at an earlier period in the more simple form of a string of primordial cells; he has not, however, been able to verify the suspicion. He refutes the opinion of Arnold, (*Lehrbuch der Physiologie*, tom. ii, p. 265,) that the thymus is a development of the respiratory mucous membrane, as well as that of Bischoff, that it is in some way connected with the thyroid gland. The development of the gland proceeds in the same manner as that which has been observed as the primordial tube of the true glands, that is to say, by the addition of diverticula, which spring from the sides of the tube. These diverticula, when they have arrived at three fourths of a sphere, themselves give rise to secondary bulgings, which again reproduce others, until at length by the repeated occurrence of the same process, conjoined with a continued interstitial molecular increase, the organ attains the bulk and complexity of the structure exhibited by it in the mature state of the fœtus.

The researches of Mr. Simon confirm in the main the dissections of Sir A. Cooper, with respect to the existence of a central cavity; he thinks, however, that it has hitherto been supposed to be larger than it really is. They likewise accord with those of Haugsted, in reference to the period at which the thymus attains its greatest size, this being, not as is commonly supposed during intra-uterine life, but at a certain period after birth. This exact time it is not easy to ascertain, as it is probable that it varies in

* For an account of which see Mr. Paget's Report, January 1845, p. 267, and Gazette Médicale, 27 Avril, 1844.

† Physiological Essay on the Thymus Gland. 4to. London, 1845.

different instances ; it has, however, been laid down as a law by the author, that its bulk is inversely as the amount of motility and consequent exhaustion of tissue, and its duration, therefore, dependent upon the period at which muscular activity becomes established. In reference to this point the author has arrived at the following results:—1st. During the period next succeeding birth, the activity of the thymus is remarkable ; it increases considerably in size, becomes turgid with secretion, and its specific gravity is lowered by the greater fluidity of its contents. This first growth is far out of ratio to the general increase of the body. 2d. For several months it continues to increase at a diminished rate, and merely in proportion to the general growth of the body ; its further enlargement ceases about two years after birth. 3d. From this time, during a *very variable* number of years, it remains stationary, and, supposing the individual to be adequately nourished, gradually assumes the structure of fat. 4th. The duration of its decay, and the epoch of its entire vanishing are still more uncertain ; about puberty, it seems in most cases, to suffer its chief loss of substance, and to be reduced to a vestigiary form.

The first appearance of this organ before birth is supposed by anatomists to be as early as the fifth week after conception, but in the tenth week of pregnancy it is sufficiently perceptible to the naked eye. It at this time exhibits a distinct tubulo-vesicular structure. The third chapter of the work contains a description of the mature gland. Its mode of formation has been already alluded to, it remains only to mention the intervesicular structure and the contained fluid. The intervesicular tissue is a prolongation of the wall of the original tube, and consists of an indescribably fine membrane, over which a close capillary network is spread for the purpose of supplying materials for secretion. This secretion consists of a fluid in which, as was discovered by Hewson, microscopic corpuscles were seen to float. These corpuscles are circular discs of nearly the same size as the coloured particles of the blood. Their average diameter is $\frac{1}{3830}$ of an inch. They are marked by minute dots which are supposed to be molecules of fat in combination with fibrine or solid albumen.

The author gives three separate chemical analyses of the thymus fluid, all of which concur in demonstrating the error of the opinion that it was essentially a highly carbonaceous product. It is proved by them on the contrary that the fluid contains no more carbon than enters into the composition of muscle and blood.

The nerves of the thymus are derived from the inferior and middle cervical ganglions and from the cardiac branch of the pneumogastric nerve.

In the comparative anatomy of the gland, the author's researches have been very extensive, but our space will not allow of a repetition of the different tribes of animals in which he has carried on his investigations, we shall content ourselves with giving the following summary of the results to which they lead. 1st. The *presence of the gland* is coextensive with *pulmonary* respiration. 2d. Its shape and position are variable and unimportant. 3d. Its *size* and *duration* are, generally speaking, in proportion to the habitual or periodical activity of the animal. 4th. Where it remains as a persistent organ (as in the hybernating tribes) it is one of the general reservoirs for the accumulation of nutritive material.

In further prosecuting the developmental anatomy of his subject, the author next passes in review the maphological history of the true glandular system, with which he contrasts that of the thymus and its analogues, the thyorid, suprarenal glands, and the spleen. The principal difference be-

tween the two orders of organs appears to consist in the ultimate arrangement of their secreting cells, that of the true glands being distinctly cellular, that of the glands without ducts, consisting of the cytoblast alone, the involving cell-structure being only of exceptional formation. It is a curious fact, however, that in those animals in which the thymus becomes a permanent organ, the nucleus instead of being simply surrounded by aggregate molecules, as in the temporary state of the organ, is converted into a perfect cell. These different points are rendered plainly intelligible by the plates with which Mr. Simon's work is liberally illustrated.

We now pass on to the most remarkable part of the work, the physiology of the gland. It is thus stated by Mr. Simon:—

"It secretes into a closed cavity certain particular elements of nutrition, which are deposited differently under different circumstances, viz.:—1st, In most animals it occurs only temporarily, the secreted matter then presents itself under a *fluid form*, and closely resembles the liquor sanguinis in ultimate chemical composition. 2d. In some animals, after discharging this temporary function, it assumes one of greater permanency, the sequestration of material in the form of solid fat. In both cases, however, though peculiar, the function is especially the same, and consists in the laying by of nutrient material. How this is used up, Mr. Simon next proceeds to show. Here, however, we are called to notice a certain circumstance which is coexistent with both the temporary and the permanent function of the gland, viz., that in both, *waste of tissue* is at a *minimum*. In the younger animal, muscular activity, which mainly contributes to this waste, has not commenced; in the hybernating animal it is suspended. Now the waste of tissue being at a minimum, the pabulum for the support of the respiratory process, must be supplied from some other source."

This source Mr. Simon declares to be the nutritive matter laid up in the central cavity of the thymus as in a reservoir, and he therefore assumes the office of that gland to be that of sequestrating nutritive matter, whereby it becomes "a sinking fund of nourishment in the service of respiration."

We must apologise for this imperfect analysis of this really valuable publication, our excuse must be that it only came to hand while the preceding pages were in the press. We were anxious that no time should be lost in making our readers acquainted with its new and important contents, otherwise we should have postponed its consideration for our next Volume.

Upon the subject of the use of the thymus gland, we have next to mention a recent essay by Dr. Picci,* a review of which appears in the *Medico-Chirurgical Review* of January 1845; as will be seen, he recurs to a theory propounded nearly two thousand years ago. After glancing at the theories of his predecessors, Dr. Picci suggests that the use of the thymus is chiefly of a mechanical nature, viz. to occupy a certain space within the thoracic cavity, while the lungs remain unexpanded in the fœtus; and thus to prevent the ribs and sternum from falling in too much upon these vital organs. The size of the thymus is inversely as the volume of the lungs; and when the latter become dilated after birth by the admission of air into their cells, the former immediately begins to shrink and becomes atrophied. In truth, it is only in the adult that the thoracic parietes are moulded completely upon the lungs; for in infancy and youth it is rather the thymus that is, in their place, moulded upon the thorax. The situation of this gland, the very nature of its tissue, and the greater expansion and development of its inferior half

* Dell' ufficio del Timo, &c. Annal. Univers. di Medicina, vol. 107.

are adduced as arguments in favour of this opinion besides the well-known circumstance that, in those new-born children in whom the thorax is very largely developed, the thymus continues to increase gradually even to the end of the second year, it deserves notice that all those animals, in which the lungs are similar to those in the human subject, are provided with this gland; whereas we find it entirely wanting in those which breathe by branchiæ and membranous lungs. In hybernating animals, also, the thymus exhibits alternations of enlargement and decrease, according to the state of the respiratory organs. In the amphibia it attains its maximum of development. The circumstance too of the gland being usually rather larger than ordinary in phthisical patients, may be mentioned as lending some probability to the view proposed.

V.

REPORT ON THE PROGRESS OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY.

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The arrangement adopted in this Report corresponds, in most respects, with that adopted by the late Dr. Simon of Berlin, in his *Chemistry of Man.* After noticing the most important recent discoveries relating to the chemical constitution of the human body, we commence with the blood, lymph, and chyle, in health and disease; and then consider, in the following order of succession, the fluid secretions of the chylopoietic viscera, together with the process of digestion; the milk; the secretions of the skin and mucous membrane; the urine; fæces, and vomited matters; solid tissues: and lastly, miscellaneous morbid products.

§ I.—*Chemical Composition of the Body.*

1. *Protein Oxides.* Mulder* has continued his researches respecting the oxidation of protein with the greatest success. He has clearly established the existence of two distinct oxides of protein, to which he has assigned the names of binoxide and tritoxide of protein, because the former contains two and the latter three more atoms of oxygen than pure protein does. Before proceeding to notice these compounds further, we may remark that recent analyses have confirmed the accuracy of Mulder's original formula for protein ($C_{40}\ H_{31}\ N_5\ O_{12}$), and have shown that it gives results approximating more closely to the truth than the formula $C_{48}\ H_{36}\ N_6\ O_{14}$, adopted by Scherer and Liebig. It has been known, for some time, that by certain chemical manipulations, a substance may be obtained from protein, whose formula is $C_{40}\ H_{31}\ N_5\ O_{15} + HO$, and to which Mulder applied the term *oxyprotein.* This is the substance to which he has now given the more descriptive name of tritoxide of protein, without, however, intending to imply anything more than it contains three atoms more oxygen than protein. His recent investigations have elicited the following facts. When fibrin or albumen is boiled with water, in the course of about four hours, principles are always obtained which are soluble in water, whilst the greater part remains undissolved. On repeating the ebullition every four hours with fresh water, fresh soluble matter is extracted, the insoluble portion becoming poorer in carbon, hydrogen, and nitrogen, but richer in oxygen, until the composition is finally

* Annalen der Chem. und Pharm., vol. 47, p. 300; and Versuch einer allgemeinen physiologischen Chemie, p. 317.

constant. Moreover, the portion of albumen or fibrin soluble in water, when evaporated, extracted with alcohol, and treated with cold water, is almost entirely soluble in it; and likewise contains less carbon, hydrogen, and nitrogen, but more oxygen, than protein. The substances taken up by the alcohol are merely products of the decomposition of the soluble portion of the fibrin or albumen; and it is to them that we must attribute the ammonia produced on distilling albumen or fibrin with water. The soluble matter obtained in this way is, in every respect, identical with the tritoxide of protein, to which we have adverted: it exists, moreover, ready formed in the buffy coat of the blood, and may be obtained from it by a short ebullition. The following are its principal chemical characteristics:—It is soluble in cold water, but not in alcohol, ether, or any oils. It is perfectly neutral, and is precipitated, in the same manner, from its aqueous solution, by dilute nitric, sulphuric, hydrochloric, neutral and basic phosphoric, and tannic acids; by solutions of chlorine, bichloride of mercury, neutral and basic acetate of lead, nitrate of silver, sulphate of zinc, and peroxide of iron. It forms with metallic oxides a class of double salts, composed according to the formula $(C_{40}\,H_{31}\,N_5\,O_{15}+MO)+(C_{40}\,H_{31}\,N_5\,O_{15}+HO)$. Tritoxide of protein is not precipitated by dilute acetic acid, neutral salts of potash and soda, chloride of barium, hydrochlorate of ammonia, nor by that very delicate test for protein, ferrocyanide of potassium. It dissolves gradually in solutions of potash, soda, and ammonia. When thoroughly dried, it forms an amber-coloured powder.

Let us now revert to the undissolved residue, which ultimately assumes a uniform composition, expressed by the formula $C_{40}\,H_{31}\,N_5\,O_{14}$. It is this which is first formed from protein by the influence of the oxygen of the atmosphere. The other substance (tritoxide of protein) originates from it by the addition of another equivalent of oxygen. In this respect albumen and fibrin give different results. Albumen, without going through this preparatory change like fibrin, is at once converted into tritoxide of protein by ebullition; the insoluble portion which remains being unaltered albumen. From its composition it has received the name of binoxide of protein. It exists ready formed in the buffy coat of the blood. Von Laer has obtained it from hair in the following manner:—The protein is first thrown down by the addition of a little acetic acid to a solution of hair in potash. On the addition of a larger proportion of free acid, after the removal of the protein, another substance, previously in a state of solution, is precipitated. This is binoxide of protein. Von Laer describes it as a bright yellow precipitate. After being carefully washed and dried, it appears as a black, glossy, resinous mass, which, on being pulverised, forms a dark, amber-yellow powder. It is insoluble in water and alcohol, but dissolves perfectly in dilute acetic, hydrochloric, nitric, and sulphuric acids. Ferrocyanide of potassium precipitates it from its acid solutions. It is soluble in potash and ammonia.

In order to obtain these products of the oxidation of protein, by boiling fibrin in water, it is essentially necessary that there should be free access to the atmospheric air.

The products of the oxidation of protein occur constantly in the blood; they are formed in the lungs from fibrin, a substance which has been shown by Scherer to possess the property of absorbing oxygen, when in a moist state.

In inflammatory conditions, a considerably larger quantity of protein in an oxidised state is contained in the body than occurs in a normal condition of the system.

2. *Fibrin.* Zimmermann* has made some experiments on the solubility of fibrin in saturated solutions of various salts; but as the fibrin was obtained from the buffy coat of the blood, which has been shown by Mulder's researches to consist of the binoxide and tritoxide of protein, and which, probably, contains no true fibrin, it is unnecessary to state his results.

Wurtz finds in the products of the putrefaction of fibrin, exposed in summer for eight days to the air, albumen, carbonic acid, acetic acid, *butyric acid*, and ammonia. He infers from the occurrence of butyric acid, that fibrin, and perhaps other protein-compounds, may be transformed into the neutral fatty bodies, which are so closely connected with the volatile fatty acids.

3. *Albumen.* Wurtz has succeeded in removing from the albumen of white of egg all the inorganic matters, which have been supposed, by certain chemists, to be the cause of its solubility in water. Neither its solubility, nor any of its chemical characters, appeared in any degree affected.

Hoffmann† inserted a square inch of the mucous membrane of the duodenum of a calf into a vessel containing serum of the blood. In the course of eight days, (a temperature of about 90° being preserved,) a coagulum, occupying half the original volume of the serum, had formed; the supernatant fluid was no longer alkaline, did not coagulate on heating, had a caseous odour, and was covered with a white film. From experiments made on the coagulum, he conceives that the albumen is converted in this experiment into casein and fibrin. The chemical proofs of such a change are, however, defective.

Hruschauer‡ has published an elaborate essay, with the view of proving that albumen is an acid. The experiments have been repeated, and the conclusions denied, by Berzelius.

4. *Ammonia given off by Albuminous Fluids.* M. Turck§ communicated a memoir to the Academy of Sciences on the chlorides occurring in albuminous fluids. All the albuminous liquids he has yet examined, viz. the saliva, serum of the blood, and white of eggs, are continually disengaging ammonia. He conceives that this gas is due to the simultaneous presence of muriate of ammonia and caustic soda in these fluids. The soda becomes converted into a muriate, and ammonia is then slowly liberated. In fresh albuminous liquids there is not the least trace of chloride of sodium; it is only in virtue of this reaction that this salt is progressively formed. While the soda is replacing the ammonia, a very singular phenomenon of crystallization is exhibited. M. Turck concludes by observing, that the evolution of ammonia from albuminous liquids performs an important part in the animal economy.

5. *Lactic Acid.* The existence of this acid and of its salts in the animal fluids is denied *in toto* by the Giessen school. Enderlin,‖ acting under the superintendence of Liebig, analysed the ash of the blood of man, the ox, the sheep, the calf, and the hare, the ash left

* Pharm. Centr. Blatt, 1843, p. 614; and the Annual Report, &c., by Berzelius. French Ed., 1845, p. 371.
† Ann. der Chem. und Pharm., vol. 45, p. 118.
‡ Annual Report, &c., by Berzelius, p. 348.
§ Gazette Med. de Paris, Feb. 8th, 1845.
‖ Annal. der Chem. und Pharm., vol. 46, p. 164.

by the incineration of the saliva and the fæces of man, and the ash of the flesh of the ox. Although the occurrence of carbonates in the ash would be no proof of the existence of lactates, their absence is usually regarded decisive proof of their non-existence, since the lactates with fixed bases are converted, by a red heat, into carbonates.

According to Enderlin, the addition of an acid to the ash caused no effervescence; and in this manner, the non-existence of a carbonate in the ash, and consequently, as he supposes, of a lactate in the substance from which the ash was obtained, was demonstrated. Enderlin likewise endeavoured to obtain lactic acid in the form of lactate of zinc from the extractive matters of blood, but always without success, unless a little lactic acid had been previously added. Moreover, Liebig and Haidlen have disproved the existence of lactic acid in the urine and milk respectively.

Berzelius, upon whom Liebig charges the offence of first introducing lactic acid into the list of constituents of the human body, seems still unwilling to yield the point. In his report for the past year he observes, in relation to Enderlin's results, that "his experiments sufficiently prove that *he* has found no traces of lactic acid in the blood. It is possible, however, that others may be more fortunate." *

Pelouze, † to whom, in connection with Gay-Lussac, we are indebted for a great part of our knowledge regarding lactic acid, seems by no means inclined to agree with Liebig and Enderlin in the exclusion of this acid from the constituents of the animal body. "Lactic acid," he observes, "is one of the most abundant substances in the animal economy and in vegetables, and it seems sometimes to perform an important part. It exists naturally in milk, and is abundantly formed during the spontaneous acescence of that fluid. MM. Bernard and Barreswil have just proved its existence in the gastric juice. It results from some observations of M. Gobley, not yet published, that it is also found in a free state in the white of egg. . . . . I will add, without fear of contradiction, that it is to be regretted that the numerous analyses which have been made of the organs and of the secretions of animals, have not always been preceded by a more profound examination of the constituent principles of these organs and of these secretions."

We have reason to believe that considerable light will be thrown upon this subject by some experiments that are being conducted at the present time.

§ II.—*The Blood.*

6. *Colour.* From some experiments recently made by Scherer, ‡ it appears, that when fresh red ox-blood is deprived of its fibrin, and diluted with twice or thrice its volume of water, it assumes a dark venous tint, which is not affected by the passage of a current of oxygen through it. On the addition, however, of a little milk, oil, finely powdered chalk or gypsum, the original bright red colour is evolved. These experiments seem to prove that the bright red colour is dependent on other causes than oxidation, and that the dark venous tint does not arise from carbonic acid or carbon. In fact, Scherer conceives that they prove that the former is dependent on the presence of white par-

* Report on the Progress, &c., French Ed., p. 373.
† Journal de Pharmacie et de Chimie, Jan. 1845.
‡ Quoted in Mulder's Versuch einer allgemeinen physiologischen Chemie, p. 351.

ticles of chyle suspended in the fluid; an opinion confirmed by the microscope. It was observed by Hewson (as far back as the year 1775) that when the colour of the blood is bright red, the corpuscles are always biconcave; they reflect a large amount of light, and in this respect act as the chalk, &c. in Scherer's experiments. When, on the other hand, the blood is of a dark colour, the corpuscles are biconvex, and the capsule is so thin as to admit of the easy passage of the whole light through it. If the blood remain in contact with water till a dark tint becomes apparent, and a saturated solution of a neutral salt be then added, the corpuscles again become biconcave, in consequence of their being partially emptied by the endosmosis called into play by the different fluids within and without the capsule, and the original bright red colour re-appears. Mulder explains the difference between the colour of arterial and venous blood in the following manner:—Two oxides of protein are formed in the act of respiration; they have a strong plastic tendency, and solidify round each corpuscle, making the capsule thicker and better qualified to reflect light. Each corpuscle of arterialised blood is thus, in reality, invested with a complete envelope of buffy coat, which gradually contracts and forms the cupped or biconcave surfaces, which, as we have already shown, are favourable to the reflection of light. On reaching the capillaries, the oxidised protein is deposited, and is probably engaged in the process of secretion; while the corpuscles, losing their opaque investment and their cupped form, can no longer reflect light, and the blood assumes a venous tint.*

Mulder has recently proved that the elementary composition of hæmatin, the ordinary red colouring matter of the blood, is precisely identical, whether obtained from arterial or venous blood, and that it may be represented by the formula $C_{44}\ H_{22}\ N_3\ O_6\ Fe$. He has likewise found, that on passing a stream of chlorine gas through water containing hæmatin in suspension, the iron leaves the other elements and forms a chloride of iron; while the atom of iron thus removed is replaced by six atoms of chlorine, and a compound is formed which is represented by the formula $C_{44}\ H_{22}\ N_3\ O_6 + 6\ Cl\ O_3$. During this process the red colouring matter is destroyed, and the new compound appears as a white flocculent precipitate. It must not, however, be assumed, from this experiment, that the red colouring matter is dependent on the iron; for that constituent may be removed from the hæmatin, without materially affecting its tint, as may be shown in the following manner:—Let some dried blood be mixed with concentrated sulphuric acid, and after standing for some days, let water be added. Hydrogen gas is evolved by the action of the acid on the dried blood, and sulphate of the protoxide of iron is formed. If the blood, after the process, be carefully washed, a mixture of alcohol and sulphuric acid will extract from it red hæmatin in combination with sulpho-proteic acid, but perfectly free from iron.

Van Goudover has deduced the following formula for this compound.

$$C_{84}\ H_{57}\ N_8\ O_{22},\ S\ O_3 = C_{44}\ H_{22}\ N_2\ O_6 \text{ (the organic part of hæmatin)} + C_{40}\ H_{31}\ N_5\ O_{12},\ SO_3 \text{ (sulpho-proteic acid)} + 4\ H\ O.$$

Although this experiment affords conclusive evidence that the red colour of the hæmatin is not dependent on the iron, yet this metal is very firmly combined with the four organic elements of this constituent.

* See supra, p. 250.

Well prepared hæmatin may be submitted for several days to the action of dilute hydrochloric or sulphuric acid, without the iron diminishing in the slightest degree. Hæmatin treated in this manner, left, after incineration, 9·49% of peroxide of iron, the amount that is always yielded by well purified hæmatin.

§ III.—*Respiration.*

7. There are two rival theories respecting the manner in which oxygen is taken up by the blood, and conveyed to the peripheral system. Liebig maintains that this is effected solely by the iron in the corpuscles, while Mulder refers it entirely to the oxidation of protein-compounds. Liebig asserts that the corpuscles of arterial blood contain peroxide of iron; that, in their passage through the capillaries, they lose a portion of their oxygen, and combine with carbonic acid; so that, in the venous system, they no longer contain peroxide, but carbonate of the protoxide of iron. When they reach the lungs, an exchange takes place between the carbonic acid of the blood and the oxygen of the atmosphere. Mulder, on the other hand, denies that the blood corpuscles are conveyers of oxygen, and that iron is oxidised during respiration, as assumed by Liebig; and he founds his conclusions on the following grounds:—

α. The iron is so intimately connected with the other elements of hæmatin, that it cannot be removed even by long digestion of this constituent in dilute hydrochloric or sulphuric acid; consequently it is highly improbable that it should be oxidised in the lungs. Liebig, indeed, observes, that dilute acid removes iron from dried blood: but Mulder gets over this difficulty, by showing that other constituents of the blood, besides the colouring matter, contain this metal, apparently in an oxidised state.

β. If, as Liebig asserts, peroxide of iron exists in arterial, and carbonate of protoxide of iron in venous blood, almost any dilute acid would be capable of extracting the oxide; which we have shown not to be the case.

γ. Assuming, with Liebig, that the iron exists in arterial blood as a peroxide, the organic part of hæmatin would be different: instead of being $C_{44}\,H_{22}\,N_3\,O_6$, it would be $2\,(C_{44}\,H_{22}\,N_3\,O_6\,Fe) - Fe_2\,O_3$, or $2\,(C_{44}\,H_{22}\,N_3\,O_{4.5})$.

δ. The probability of the existence of the iron in a metallic state is very strong.

ε. The amount of hæmatin in the whole mass of the blood is far too inconsiderable to carry a due supply of oxygen to the whole system.

8. *Expiration of Carbonic Acid in Disease.* Macgregor ascertained that the air expired by persons ill of confluent small-pox contained as much as 8% of carbonic acid. During the eruptive fever of measles, it amounted to from 4 to 5%; and in proportion as the health was restored, the per centage was diminished to its natural standard. In chronic skin diseases an augmentation was likewise observed; and in a case of ichthyosis the mean per centage was 7·2. In typhus, according to Dr. Malcolm,* the formation of carbonic acid is diminished. In diabetes, no deviation from the normal standard could be detected. The question of the quantity of carbonic acid expired by a person in twenty-four

* London and Edinburgh Monthly Journal of Medical Science, 1843, p. 1.

hours, has lately become of peculiar interest, in consequence of its association with several problems of high physiological importance. Liebig has endeavoured, indirectly, to estimate the quantity, by comparing the amount of carbon contained in the food consumed in the twenty-four hours, with the carbon of the excretions during the same period, and estimating the difference as the quantity separated by the respiratory process. He thus found that an adult, taking moderate exercise, expires daily, on an average, 1·39 ounces of carbon (more than double the quantity found by Lavoisier). Experiments have recently been made by Andral and Gavarret, Scharling, and Brunner and Valentin, with the view of ascertaining this point, and of elucidating the chemical bearings of this department of physiology. We shall endeavour to give, as briefly as possible, their most important results.

9. *Absolute Quantity of expired Carbonic Acid.* Andral and Gavarret expressed their results per hour. They are contained in the following table:—

MALE SEX.

Age.	Muscular Development.	Carbon exhaled per Hour. Grains.
8.	Moderate	77·0
10.	Very great	104·7
12.	Moderate	113·9
12.	Great	127·8
14.	Moderate	126·2
16½.	Good	157·0
18.	Good	169·4
20.	Good	166·3
24.	Moderate (mean of 2)	176·6
26.	Extraordinarily great	217·1
		217·1
26.	Moderate	169·4
28.	Good	190·9
32.	Good	176·6
33.	Moderate (mean of 6)	164·7
37.	Moderate	164·7
40.	Very great	186·3
45.	Very slight (mean of 4)	132·4
48.	Good	161·7
50.	Good	164·7
54.	Very great	163·2
59.	Moderate	154·0
60.	Extraordinarily great	209·4
63.	Extraordinarily great	190·9
64.	Slight	133·9
68.	Moderate	147·8
76.	Slight	92·4
92.	Extraordinarily great	135·5
102.	Extremely diminished	90·8

FEMALE SEX.

Periods of Life.	Age.	Muscular Development.	Carbon exhaled per Hour. Grains.
Prior to the appearance of the catamenia.	10.	Good	92·4
	11.	Good	95·4
	13.	Great	97·0
	15½.	Very great	109·3
During menstrual life.	15½.	Moderate	97·0
	19.	Very great	107·8
	22.	Good	103·1
	26.	Slight	92·4
	26.	Moderate	97·0
	32.	Moderate	95·4
	45.	Moderate	95·4
After cessation of catamenia.	38.	Moderate	120·3
	42.	Good	127·8
	44.	Very great	152·4
	49.	Moderate	113·9
	52.	Moderate	115·5
	56.	Moderate	119·3
	63.	Moderate	106·2
	66.	Moderate	104·7
	76.	Very great	101·4
	82.	Moderate	92·4
3 mo. pregnt.	42.	Good	120·3
5 mo. ditto	32.	Good	126·7
7½ mo. ditto	18.	Slight	112·4
8½ mo. ditto	22.	Good	129·3

It is thus seen that, in general, the amount of carbonic acid expired by both sexes increases with age up to a certain point, the 40—45 year, and then diminishes; that the quantity of carbonic acid expired increases

with the development of the muscular system; that women expire less carbonic acid than men; that the formation of carbonic acid attains its maximum at the commencement of menstruation, and then experiences no further increase, except in the pregnant state, until the cessation of menstruation, when an increase again takes place. On an average, an adult male, of moderate constitution, exhales from 160 to 170 grains of carbon per hour; an adult female, in the unimpregnated state, from 100 to 110 grains; during pregnancy, 125 grains; and after menstruation has ceased, from 116 to 130 grains. Dumas also found 154 grains per hour as the average quantity of carbon exhaled by an adult male. Scharling's experiments were made on the following individuals:—1st, a male, æt. thirty-five, weighing 131 lbs.; 2nd, a male, æt. sixteen, weighing 115½ lbs.; 3rd, a soldier, æt. twenty-eight, weighing 164 lbs.; 4th, a girl, æt. nineteen, weighing 111 lbs.; 5th, a boy, æt. nine and three-quarters, weighing 44 lbs.; and, 6th, a girl, æt. ten, weighing 46 lbs. The carbon exhaled per hour amounted to—

No. of the person.	Amount of Carbon. Grains.	Remarks.
1. In June, when very hot.	145	Fasting
	190	After breakfast and a walk.
	130	Hungry.
	165	2 hours after dinner.
	160	After tea.
	100	Whilst asleep.
2. In June, when very hot	114	Sleepy.
	144·2	Fasting.
	139·8	Fasting and hungry.
	177	Half an hour after breakfast.
	167·7	2½ hours after breakfast.
	180·8	2 hours after dinner.
3. In October.	137·8	Asleep.
	111·9	Fasting.
	159·4	Fasting after breakfast and work.
	188·9	After dinner.
	194·7	3 hours after dinner.
	178·3	After work.
	122·3	Whilst asleep.
4. In October.	98·9	Whilst eating.
	91·3	Fasting.
	92·6	After supper.
	133·8	1 hour after breakfast.
	117·0	1 hour after dinner.
	108·9	Whilst eating.
5. In Autumn.	76·2	Fasting.
	94·8	Whilst at breakfast.
	113·8	After breakfast.
	119·3	1 hour after dinner.
	84·5	2 hours after supper.
	74·8	Whilst sleepy.

No. of the Person.	Amount of Carbon. Grains.	Remarks.
6. In Autumn.	65·5	Whilst asleep.
	95·3	After breakfast.
	103·0	After dinner.
	99·0	Shortly after tea.
	75·1	Whilst asleep.

Supposing that adults sleep seven, and children nine, hours per day, the amount of carbon consumed is, on an average—

	In 24 hours.	In 1 hour.		In 24 hours.	In one hour.
1.	3380 grains.	141 grains.	4.	2555 grains.	106 grains.
2.	3455 ,,	144 ,,	5.	2050 ,,	86 ,,
3.	3692 ,,	154 ,,	6.	1938 ,,	80 ,,

It is thus evident that the quantity of carbonic acid expired is very variable, and that it may be altered by many circumstances. Hunger and rest diminish, satiety and labour increase, it. It is greater during the day than the night, in the proportion of 1·237 to 1. If the expired carbonic acid be estimated in relation to the weight of the body, it is found that children give off a proportionally greater amount of this gas than adults. In some forms of disease, the amount of expired carbonic acid falls below the standard; it seems, in a state of health, to vary directly with the activity of the circulation. The influence of muscular activity on the amount of carbon consumed, has been clearly shown by some experiments made by Dr. Hoffmann, during a pedestrian tour. His diet was simple and scanty; he took no drink, walked during the whole day, weighed all his food and every excretion that could be weighed, (even the nasal mucus,) as well as himself: he then found that the weight lost by the body was never equalled by the excess of the excrements over the food, and that there was a constant loss of matter by the skin and lungs, which amounted to more than 1 lb. We must pass over the details of his experiments. Brunner and Valentin found that the weight of carbon they consumed per hour varied from 134 to 170 grains, and averaged 160. The volume of expired carbonic acid per hour, on an average, was equal to 21·8 litres,* and the entire volume of the air expired per hour, on an average, equal to 540 litres. These results agree well with those of the earlier observers. When the corrections for moisture are made, the quantity of carbon expired per hour is equal on an average to 172 grains, and of carbonic acid to 23·5 litres.

10. *Relations of the Constituents of the expired Air to the Theory of Respiration.* On this point Brunner and Valentin only have experimented. They found—

Individual.	No. of Experiments. Mean of	Volume per Cent. CO_2.	O.	N.	Volume per Cent. in relation to the Atmosphere. Disappeared O.	Difference of N.
Brunner	12 Exp. 1st series	4·356	16·007	79·547	4·720 +	0·362
	4 Exp. 2nd ,,	3·825	16·306	79·869	4·508 +	0·683
Thomas	4 Exp. 1st ,,	4·673	15·895	79·432	4·920 +	0·329
Valentin	2 Exp. 1st ,,	4·316	16·143	79.541	4·671 +	0·356
	12 Exp. 2nd ,,	4·641	15·783	79·576	5·032 +	0·391
	Total average	4·380	16·033	79·587	4·783 +	0·402

* The litre is a little larger than the English wine quart.

Individual.	No. of Experiments.	Volume per Cent. CO_2	O.	N.	Volume per Cent. in relation to the Atmosphere. Disappeared O.	Difference.
		Weight per Cent.				
Brunner	12 Exp. 1st series	6·522	17·428	76·050	5·582 —	0·940
	4 Exp. 2nd „	5·749	17·735	76·516	5·275 —	0·474
Thomas	4 Exp. 1st „	6·975	17·165	75·860	5·845 —	1·130
Valentin	2 Exp. 1st „	6·454	17·481	76·061	5·529 —	0·929
	12 Exp. 2nd „	6·945	17·089	75·965	5·920 —	1·025
	Total average	5·546	17.373	76·081	5·637 —	0·909

It is evident that the variations observed in the amount of nitrogen are entirely within the errors of observation, and the nitrogen may be disregarded in the process. Again, the expired air contains a volume of carbonic acid, which is but little less than the volume of oxygen which has disappeared, (therefore the weight per cent. of the carbonic acid is necessarily somewhat greater than that of the absorbed oxygen, and thus also the difference of nitrogen appears positive as regards volume, but negative as regards weight); so that all the oxygen absorbed reappears as carbonic acid, except a small quantity consumed in the body for other purposes. Now, according to Graham's law of the diffusion of gases, when they are separated by an animal membrane and are under equal pressure, they become mixed inversely as the square roots of their densities; consequently, 1·17585 volume of oxygen is absorbed for 1 volume of expired carbonic acid. Comparison of the figures obtained for the carbonic acid, and absorbed oxygen, almost exactly agreed with those reckoned according to the laws of the diffusion of gases.

Volume of the expired Air. CO_2.	O.	N.	Oxygen absorbed.	Carbonic Acid calculated.		Difference.
3·850	16·270	79·185	4·690	3·994	+	0·144 per cent.
3·593	16·034	79·185	4·931	4·199	+	0·606 „
3·949	16·090	79·185	4·887	4·162	+	0·213 „
3·777	16·090	79·185	4·914	4·192	+	0·415 „
3·759	16·095	79·185	4·922	4·192	+	0·433 „
4·483	15·328	79·185	5·698	4·853	+	0·370 „
4·752	14·733	79·185	6·362	5·418	+	0·660 „
4·588	14·852	79·185	6·253	5·325	+	0·737 „

In respiration, which is thus a purely mechanical process, the inspired air is first warmed to 99·5°, and saturated with moisture at this temperature, which is rapidly accomplished on account of its extensive distribution. It then experiences a simple diffusion; the nitrogen remains entirely unaffected; 1·1742 volume of oxygen is absorbed, and replaced by 1 volume of carbonic acid which is expired; or, for each volume of oxygen absorbed, ·8516 volume of carbonic acid appears. In consequence of the accuracy with which the law of diffusion is here observed, the most minute portion only of other gases is absorbed or expired. That hydrogen, carburetted hydrogen, and carbonic oxide gases are not contained in the expired air, the authors have shown by some direct experiments; but small quantities of organic matters are evolved during respiration, as is shown by sulphuric acid, through which expired air has been made to pass, being always coloured red.*

11. *On Respiration. By Magnus.*† At the sitting of the Royal Academy of Berlin, June 17, 1844, Magnus communicated some remarks

* For further information on this subject, the reader is referred to Valentin's Lehrbuch der Physiologie, vol. I. pp. 507—580; or to an excellent abstract that appeared in The Chemical Gazette.

† The Chemist, February, 1845.

on respiration. A short time back, Gay-Lussac submitted* to the Academy of Sciences at Paris, a critical review of a work on the gases contained in the blood, viz., oxygen, hydrogen, and nitrogen, published by Magnus seven years ago. According to this review, which however contains no new experiments, the theory of the function of respiration established as the result of that work would be destitute of any experimental basis; and must be considered as a mere speculation, or as derived from experiments which are rather calculated to prove the reverse of the inferences deduced from them.

The various theories relative to respiration may be comprised under the following heads:—

1. The older theory of Lavoisier, that the inspired oxygen combines in the lungs with a portion of the carbon of the blood, and escapes as carbonic acid with the air expired.

2. Theories according to which the inspired oxygen produces in the lungs new combinations, which, afterwards uniting in the capillary vessels only with carbon and nitrogen, are converted into other combinations, and return with the venous blood to the lungs; where, on the accession of oxygen, they are decomposed, and separated as water and carbonic acid. In these theories, which, in opposition to the following, may be called the *chemical* ones, the separation of the carbonic acid and real oxidising process invariably takes place in the lungs; and in this they differ from the following, which may be called the *theories of absorption.*

3. The theory by which it is maintained that the inhaled oxygen is merely absorbed by the blood, and conveyed to the capillary vessels, in which it is employed to oxidise certain substances, converting them into carbonic acid and water, which are received by the blood, and return with it to the lungs, where, coming in contact with the air of the atmosphere, they are excreted; after which a fresh quantity of oxygen is absorbed, which undergoes the same changes. In addition to these, as a fourth theory may be considered—

4. The oxygen enters into chemical combination with the blood in the lungs, which is decomposed in the capillary vessels, there producing water and carbonic acid. These bodies are received by the blood, without, however, forming with it a chemical combination, and are removed in the lungs on coming into contact with air.

After having shown in the above-mentioned work,† that, on passing hydrogen, nitrogen, or atmospheric air through venous blood, carbonic acid is disengaged, the quantity of the latter body remaining the same, whatever kind of gas was employed for that purpose, and that *in vacuo*, on sufficient rarefaction from the same liquid, carbonic acid is likewise obtained, and that, consequently, venous blood contains carbonic acid in a real state of absorption, an assertion which, a short time before, was controverted; it seemed probable that the function of respiration takes place according to one of the theories of absorption.

To establish this assertion, it is not sufficient to prove that carbonic acid is present in both venous and arterial blood, and that oxygen and nitrogen are found in both; because the blood might contain all the three gases merely in a state of absorption, without their participating in the act of respiration. But if this be the case, the arterial blood

* Comptes Rendus, vol. xviii. p. 546; and The Chemist, June, 1844.
† Poggendorff's Annalen, xl. 583.

should contain as much oxygen, and this body be therein in the same proportion with reference to the carbonic acid, as occurs in venous blood. This circumstance serves as a means for examining whether or not the absorbed gases really act any part in the function of respiration. If, therefore, to show that in arterial blood the carbonic acid is displaced by an equal volume of oxygen be still a desideratum, still the proofs given that the proportion of oxygen, relative to carbonic acid, is greater in arterial than in venous blood, fully warrant the conclusion that the respiration is, at least to a certain extent, based on absorption. This alone was the object of that work. Of this manner of arguing, however, Gay-Lussac makes no mention whatever. He re-calculates the results of the experiments, and reduces the quantities of gases obtained to the same volume of blood; though, throughout the description of these experiments, it appears that the quantity of air separated from the blood was at one time greater, and at another less; and after having communicated those experiments, it was expressly stated (page 600), "that the circumstance that the quantities of air obtained in the several experiments are not entirely concordant, is to be attributed to the circumstance that the above-described access given to air by means of a tube screwed on, could not be repeated in all experiments in a like number of times, because the period during which the froth was settling likewise varied."

Gay-Lussac observes, that it is against his arguments that only the tenth part of the carbonic acid was subtracted from the blood. "But," he continues, "it is, notwithstanding, to be supposed that the fractional quantities of carbonic acid obtained by Magnus, are proportional to the whole amount of it contained in the various kinds of blood." It must be well remarked, that on this ground the whole conclusion is based. It would be true, on the supposition that the air was always under the same circumstances subtracted from the blood; but, from the passage quoted above, it appears that this could not be done. The following was the mode of operating:—A vacuum was produced over the blood, the gases filling it passed into another vessel; and, the vacuum thus again restored, the same process was repeated as many times as, on account of the froth remaining on the blood, could be managed. The circumstances, therefore, under which the gases were subtracted from the blood were certainly not always the same. In addition to this, it appears by a simple calculation that, on separating from a liquid several gases absorbed by it, their relative amount in the first portions differs from that occurring in the subsequent ones: a fact of which no one is better aware than Gay-Lussac, he having proved it by experiments mentioned by himself in the very review in question, on the quantities of oxygen and nitrogen absorbed by water, when exposed to atmospheric air, instituted by himself, in common with M. de Humboldt; and though in those experiments the gases were removed by boiling, it is yet evident that by this operation nothing else happens than that the pressure under which they exist is removed.*

We cannot conceive, therefore, how Gay-Lussac could maintain that the quantities of carbonic acid obtained in the single experiments should

* These gentlemen, having disengaged, by boiling, the air from water of the Seine, and collected it in fractioned portions, found it to be of the following composition:—

First portion, 23·7 oxygen, 76·3 nitrogen.	Third portion, 30·2 oxygen, 69·8 nitrogen.
Second „ 27·4 „ 72·6 „	Fourth „ 32·5 „ 67·5 „

—*Journal de Physique, par Delamétherie*; and *Gilbert's Annalen*, xx. 133.

always be proportionate to its whole amount occurring in the blood; it having consisted sometimes of six, but generally of from ten to twelve proportions yielded to the vacuum.

But if this proportion does not exist, the principal argument of the whole critical review falls to the ground. For to reduce the quantities of the gases obtained to an equal volume of blood, is then incomprehensible.

Gay-Lussac, moreover, takes a mean from the experiments calculated in that manner. It is, however, not judicious to proceed thus; for the blood of the same animal varies at different times, especially if venesection has been performed some days previously, and this is still more the case when various animals are employed in the experiments; but, besides these, if, in experimenting with venous blood, some animals furnished blood containing a less amount of air than others did, the sums of gas of all the experiments with venous blood, relative to the blood employed, will be less than that of the experiments with the arterial blood. But it is clear, that a smaller quantity of air withdrawn must contain less carbonic acid than a larger one. According to Gay-Lussac, the whole quantity of the arterial blood employed in his experiments drawn from various individuals, of calves and horses, amounts to 608 cubic centimetres; and the gas separated from it to 63·4 cub. centim., or 10·43 per cent. of the blood: whereas the sum of the venous blood amounts to 8·63 cub. centim., from which 66·3 cub. centim., or only 7·68 per cent., were separated. It is not surprising that, in calculating the amount of carbonic acid, according to these numbers, more of it is found in arterial than in venous blood. But this result is merely accidental; for it might have happened that much more or much less air might have been separated from the venous blood. The conclusion, therefore, that it appears from these experiments that less carbonic acid is contained in venous than in arterial blood, is erroneous, because the experiments were neither meant to prove, nor could they prove, in what ratio the gases stand with reference to the blood; but it was merely stated, that in arterial blood the proportion of oxygen, relative to carbonic acid, was greater than in venous blood. And this they indeed show; for on considering the sums of the experiments, according to the very calculation of Gay-Lussac, we find

	Arterial Blood.			Venous Blood.		
Carbonic acid .	39·5	or 62·3	per cent.	47·5	or 71·6	per cent.
Oxygen . .	14·7	,, 23·2	,,	10·1	,, 15·3	,,
Nitrogen . .	9·2	,, 14·5	,,	8·7	,, 13·1	,,
	63·4	100·0		66·3	100·0	

That M. Gay-Lussac did not mention this result is the more striking, it having been expressly stated in the treatise (page 600), "From this table it appears that the ratio of oxygen, with reference to the carbonic acid, is greater in arterial than in venous blood."

After having shown the real bearing of the proportion on which the whole critical review of Gay-Lussac is chiefly based, we must not leave unnoticed the other remarks contained therein. In the treatise quoted, it was proved, so far as it could be done by the data obtained, that the carbonic acid absorbed by the blood is sufficient to yield the whole quantity of the carbonic acid expired by an adult person. Gay-Lussac, however, goes beyond this; based on the suppositions there made,

(though they might have been too high by double their given amount,) he calculates how much oxygen is absorbed by the arterial blood. He is of opinion that this blood must contain not only a volume of oxygen equal to that of the carbonic acid expired, for the production of which it was employed; but, in addition to this, one-third more of oxygen, to generate the water expired: from which it would follow, that one-third more of oxygen is invariably inspired than carbonic is expired. This, however, is opposed to all experiments on respiration.

The circumstance that the substances secreted in the capillary vessels need not to consist merely of carbon and hydrogen, but may likewise contain oxygen, has evidently been lost sight of. The composition of expired and inspired air positively shows that these substances still contain a sufficient quantity of oxygen to form water with the hydrogen, if this liquid was not already separated as such in the capillary vessels.

In a second calculation based on various suppositions, Gay-Lussac arrives at the conclusion, that in the act of respiration the venous blood gives up 13 per cent. of its volume of carbonic acid; and that, to effect this, 17 per cent. of it must be contained therein. He, however, says, "This (the 17 per cent.) is the minimum of carbonic acid which venous blood should contain; and, as arterial blood also contains it, this minimum would be the difference of the quantities of carbonic acid contained in each blood."

It is inconceivable how this could have been asserted, it having been stated just now that the difference of the carbonic acid of the two kinds of blood amounts as a minimum to 13 per cent., in consequence of which, in arterial blood four per cent. would remain as a minimum. By the first calculation, Gay-Lussac obtained the result, that arterial blood, on coming into contact with atmospheric air, may absorb 22·45 per cent. of oxygen in volume, or 24·2 times more than pure water absorbs under similar circumstances. This solubility of oxygen in blood, says Gay-Lussac, is not impossible; but it ought to have been proved, or at least made probable. This reproach, not considering the stated error, is well-founded, and the author is at present occupied with instituting fresh experiments on that score; but, in case these do not happen to corroborate the numbers calculated by Gay-Lussac, they will not lessen the validity of the argument, that carbonic acid absorbed in blood acts a part in the respiration.

In concluding his review, Gay-Lussac disproves that the change of colour in the venous blood was for the greatest part accounted for by the loss of carbonic acid occurring in the lungs. He cannot admit these views, he says, for two reasons. The first is, that it had not been demonstrated that venous blood yields carbonic acid to the lungs; and yet, as was before shown, this is proved by the very fact that the ratio of carbonic acid, in reference to oxygen, is greater in venous than in arterial blood. The second reason is that, even granting that carbonic acid is yielded to the lungs, yet a large portion of it remains in arterial blood; and we are not warranted in explaining this very remarkable change of colour by the difference. But in this respect nobody is more convinced than the author himself; for, after having stated in his treatise that the blood, on yielding carbonic acid, becomes lighter, he says (p. 608), "On the removal of the carbonic acid, however, venous blood never became of so light a red as arterial blood; but it seems that the absorption of various kinds of gases is likewise productive of various

changes of colour. It is probable, therefore, that the red colour of arterial blood depends not only on the want of carbonic acid, but also on the absorption of oxygen."

At that time, the investigations of Peligot on the action of protoxide of nitrogen on the salts of protoxide of iron, by which the assertion that liquids, by merely absorbing, may entirely change their colour, was fully established, were not yet known. We cannot conceive why Gay-Lussac overlooks this view of the change of colour; confining himself to observing, that the author noticed that venous blood becomes lighter by giving up carbonic acid, and considered this as a co-operating means for the production of the change of colour.

From these remarks it appears—

I. That the proportion supposed by Gay-Lussac to exist between the portions of carbonic acid, and resulting in the experiments instituted, and the whole amount of these gases obtained in the different kinds of blood, does not take place, and that therefore the result derived by Gay-Lussac from that circumstance is inadmissible.

II. That from these experiments it evidently appears, that the absorbed carbonic acid acts a part in respiration; because they show that the ratio of carbonic acid to oxygen is greater in venous than in arterial blood.

III. That the calculations made by Gay-Lussac, relative to the amount of carbonic acid and oxygen existing in blood, cannot be considered as correct.

In conclusion it must be mentioned, that immediately after the communication of the said critical review, M. Magendie laid before the Academy the results of an experiment instituted by himself, which serves as a new corroborating proof of the author's views on respiration, for it shows that the carbonic acid absorbed relative to the blood is greater in venous than in arterial blood, being in the former 78 per cent., and in the latter 66 per cent.

12. *On the Respiration of Frogs.** *By Professor F. R. Marchand.* The experiments of the author were performed in a manner which removes all objections; and, moreover, so that in estimating the normal proportions the animals were surrounded by an atmosphere which was constantly changed. From them we learn in general that more oxygen is constantly absorbed than is necessary for the production of the exhaled carbonic acid, and that water is certainly formed. The experiments take account, not only of the matters exhaled from the lungs, but also from the skin. How much, however, of the phenomena is dependent upon the latter, cannot be determined for the present. As regards the loss of nitrogen, which Boussingault ascertained indirectly, in no case is it pure gaseous nitrogen, since, as the author satisfactorily ascertained, ammonia is exhaled from both the skin and lungs; nor is it at all probable that pure nitrogen is evolved. If this happens, the consumed amount of oxygen will appear too high, but at the most the error is very small. Besides ammonia, organic carbo-hydrogens are evolved from the lungs; for when the expired air is perfectly freed from water and carbonic acid, and then burnt with oxide of copper, a little carbonic acid and water are constantly obtained. In Marchand's experiments these matters were condensed in sulphuric acid; their very minute quantity is certainly contained in the exhaled watery vapour.

* Chemical Gazette, April 1, 1845.

13. *Normal Respiration of the Animals.* To render the results, which are merely enumerated further on, more intelligible, we have copiously detailed the first experiment in the table containing the results of all the experiments.

Four large animals, which were caught on the 9th of July, and were very lively, were placed in the cylinder on the 11th of June, and left therein for fifty-two hours. Notwithstanding they had been well dried, the cylinder was almost immediately moistened with condensed aqueous vapour, and at the end of the experiment a large quantity of moisture had collected in the cylinder. The animals did not lose any of their liveliness during the whole experiment. At the commencement of the experiment, the apparatus with the animals weighed 993·200 + 284·887 grammes; after the experiment, with the enclosed excrements and liquids, 993·200+283·382 grammes. The apparatus had thus lost 1·505 grammes in weight. This loss must consist of vaporised water and expired carbonic acid, or rather of their elements, given off by the animals. The chloride of calcium and sulphuric acid tubes had gained in weight 1·312 gramme (from evaporated water); the potash apparatus 2·151 grammes, consisting of carbonic acid. If the matters thus removed be added to the weight of the animals after the experiments, there must be an excess above the original weight of the animals, which, if we consider the nitrogen in normal respiration as perfectly indifferent, must consist of absorbed oxygen.

	Grammes.
	283·382
	1·312
	2·151
Total . . .	286·845
Weight of the animals before the experiment . . .	284·887
Absorbed oxygen	1·958

The expired carbonic acid, 2·151 grammes, contains ·587 gramme of carbon and 1·564 of oxygen. Thus ·394 gramme more of oxygen is absorbed than was required for producing the exhaled carbonic acid. The oxygen was probably used in the formation of water; this is rendered more probable by Boussingault's experiments on the nutrition of turtle-doves, in which the whole of the hydrogen of the food was not found in the excrements:—

Number of the Frogs.	Their Weight before the Experiment.	Loss during the Experiment.	Expired Carbonic Acid.	Carbonic contained therein.	Evaporated Water.	Absorbed Oxygen.	Oxygen contained in the Carbonic Acid.	Oxygen contained in the Water.	Duration of the Experiment in Hours.
4	284·887	1·505	2·151	·587	1·312	1·958	1·564	·394	52
5	449·120	1·220	2·112	·576	·965	1·875	1·536	·321	24
4	466·765	·750	1·007	·275	·672	·929	·732	·197	24
7	519·665	·780	1·492	·407	·668	1·380	1·085	295	25
7	543·742	·888	1·599	437	·690	1·401	1·163	238	24
5	325·411	1·021	1·044	·285	·964	·987	·759	·228	42
5	396·225	2·353	3·373	·920	1·876	2·896	2·453	·443	44

From a survey of these experiments it is seen that a much larger quantity of oxygen is absorbed than is necessary to form carbonic acid. The author observed the same in an experiment on a rabbit, which was performed with an exactly similar apparatus, except that the cylinder was exchanged for a larger one. The animal was in good condition, and confined in the apparatus for eight hours. It had passed but a small quantity of urine (9·162 grammes):

	Grammes.
Weight of the animal before the experiment	777·103
Weight of the animal after the experiment	776·683
Loss	·420
Expired carbonic acid	8·846
Evaporated water	·831
Absorbed oxygen	8·257
Oxygen in the carbonic acid	6·433
Consequently there had served for the oxygenation of the hydrogen	1·824

14. *On the Influence of the Time of the Day on the Respiration.* Prout has shown that the quantity of carbonic acid expired varies at different periods of the day. Marchand confined his experiments to ascertain whether the respiration of these animals was diminished during the night. The animals were put into the apparatus soon after being caught. They weighed 5253·52 grammes, and were seven in number. The experiment lasted from 9½ o'clock in the morning until the same time in the evening. The carbonic acid expired during this time amounted to ·570 gramme = ·155 gramme of carbon. ·507 gramme of oxygen was absorbed, of which ·415 gramme was in the carbonic acid, and ·092 gramme in the water. The proportion of the absorbed oxygen to the carbon consumed was as 327 : 100.

The animals were left in the apparatus, and the experiment concluded in twelve hours. During the night they had produced only ·435 gramme of carbonic acid = ·119 gramme of carbon; ·407 gramme of oxygen was absorbed, of which ·316 gramme was required for forming carbonic acid, and ·091 water. The absorbed oxygen was in the proportion of 342 : 100 to the consumed carbon. It is very remarkable that the amount of oxygen required for the formation of water remained the same both by day and night, whilst that for the production of carbonic acid was so essentially altered.

In another experiment, four frogs of 273·745 grammes weight, from 9½ in the morning to the same time in the evening, expired ·230 gramme of carbonic acid = ·063 carbon. They absorbed altogether ·178 gramme of oxygen; ·167 for the formation of carbonic acid, and ·011 for the production of water. During the next twelve hours of the night ·125 gramme of carbonic acid (= ·034 carbon) only was expelled, ·084 gramme of oxygen was absorbed, whilst the carbonic acid produced ought to have required ·091 gramme of oxygen. The animals had become very weak from the continued fasting.

15. *Influence of Temperature on the Respiration.* The influence which the temperature of the surrounding air exercises on the respiration was examined, by supporting the cylinder on blocks of wood in another cylinder which was higher and broader, and which was filled with water of different temperatures, which were thus at the same time communicated to the inner cylinder. The thermometer indicated the constant

temperature of the confined atmosphere. To regulate the temperature of the surrounding water, it was arranged so that it might flow over the top, whilst fresh water ran from a reservoir standing above, through a long funnel to the bottom of the vessel, whence it forced its way from below upwards. When water colder than the atmosphere was used, the arrangements were reversed. The water flowed out near the bottom, entering from above :—

Weight of the Frogs.	Temperature.	Time and Duration of the Experiment.	Expired Carbonic Acid.	Carbon obtained therein.	Absorbed Oxygen.	Oxygen in the Carbonic Acid.	Oxygen in the Water.
	Fahr.	*o'clock.*					
436·251	35–37°	8–2	·102	·0278	·0800	·0742	·0058
436·051	43–45°	3–9	·325	·0886	·3190	·2364	·0826
430·125	63–57°	6–12	·306	·0835	·2860	·2225	·0635
428·800*	64–68°	4–10	·289	·0790	·2630	·2100	·0530
428·705	82–86°	9–3	·201	.0546	·1570	·1464	·0106

It is seen from this table that in these animals the respiration was most active at a tolerably low temperature, 43–57°, and that an alteration of 43–45° had but little effect. When the temperature fell nearly to the freezing point, the respiration was much diminished; it approached nearly to the combustion of pure carbon. The same occurred at a tolerably high temperature, 82–86°, at which the animals became much weakened.

16. *Respiration in Pure Oxygen.* From his experiments on respiration in pure oxygen, Marchand found that the quantity of carbonic acid was almost unaltered, while the quantity of absorbed oxygen was much increased; consequently a much more considerable oxidation of hydrogen must have resulted from the action of the oxygen: in fact, twice as much hydrogen was oxidised as when atmospheric air was used. Nitrogen must necessarily have been exhaled in the respiration of oxygen, as was observed by the older chemists, since this gas which is contained in the blood must have been separated in consequence of the power of diffusion of the inspired oxygen.

The paper concludes with a detail of numerous experiments on the effects of respiration in pure hydrogen, in a vacuum, in a confined atmosphere, and, finally, on the respiration of the animals while fasting. During continual fasting they always absorbed less hydrogen, and exhaled less carbonic air.

17. *Vierordt on the Effect of increased Respiration on the Amount of expired Carbonic Acid.*†

The following are the conclusions at which the author has arrived, from a numerous series of experiments :—

1. The frequency of the respiration exerts a marked and very appreciable effect on the amount of expired carbonic acid.

* The animals had diminished in weight from the separation of excrements.

† Archiv fur physiologische Heilkunde, 1844, No. 4.

2. The expired air is, *ceteris paribus*, poorest in carbonic acid when the respiration is most frequent, and richest in carbonic acid when the respiration is slowest. This is a confirmation of the physiological law that the secretions and excretions are the most saturated when they are the least copious.

3. The influence of the frequency of respiration on the amount of expired air is most easily seen when the respiration is very slow.

4. At every respiration, whatever be its length, there is a constant amount of carbonic acid evolved amounting to $2{\cdot}5\frac{0}{0}$, to which there must be added a new amount of carbonic acid, varying directly with the length of the respiration.

5. The amount of carbonic acid produced during a given time, while the respiration is frequent, is, on the other hand, much larger than when the respiration is slow.

6. The number of inspirations affords the best medium of judging of the amount of excreted carbonic acid, as the number of respirations and the amount of carbonic acid generally increase in the same proportion.

7. The absolute quantity of carbonic acid produced during perfectly tranquil respiration, is to the amount during the most rapid respiration, in the proportion of 1 : 8.

8. During normal respiration, about $6\frac{0}{0}$ of the carbonic acid circulating in the capillaries of the heart are excreted.

18. *On the Influence of extreme Atmospheric Temperatures on the Amount of Carbonic Acid developed by Warm-blooded Animals.* M. Letellier has published some excellent observations on this subject. The low temperatures to which the animals were submitted varied from 23° to 37·4°; the high temperatures from 82·4° to 109 6°. The latter degree was never exceeded, as death rapidly supervened at that temperature, and sometimes even when the temperature was below 104°. The natural temperature of the body seemed to be the highest at which the animals on which he experimented could arrive. On reaching it their danger became imminent—on exceeding it death occurred instantaneously. These results caused some surprise, as being apparently contradictory to facts observed in relation to man. But if we consider the greater susceptibility of the respiratory functions in the animals experimented on, and likewise their comparatively diminutive size, which allows the heat to penetrate rapidly to the centre of vitality, we may in a considerable degree reconcile the apparent discrepancy. At a more moderate temperature, as from 82·4° to 91° 4, the animals often preserve throughout the experiment a perfectly equable respiration, and exhibit no signs of distress.

The apparatus used by Letellier is precisely the same as that employed and described by Boussingault. He finds that between 32° and 86° the variations in the amount of carbonic acid are very great; in fact, the carbon burnt at 32° is double the amount consumed at 86°. At an ordinary temperature the amount is intermediate, sometimes inclining slightly to one side, sometimes to the other. Another point worthy of notice is the similitude presented by the variations in animals so differently organized as those on which the experiments were made. Small animals produced results similar to larger ones, and the same law held for birds and mammalia.

We will, in illustration, take an animal from each category; the numbers refer to the amount of carbonic acid developed in the course of an hour:—

	Temperature of Air from 59° to 68°.	Temperature of Air from 86° to 106°.	Temperature of Air about 32°.
	Grammes.	Grammes.	Grammes.
A canary . .	0·250	0·129	0·325
A turtle-dove . .	0·684	0·366	0.974
Two mice . .	0·498	0·268	0·531
A guinea-pig . .	2·080	1·453	3·006

Here we see that the carbonic acid exhaled at 32° amounts in the mammalia to double the amount at an elevated temperature, and in birds the difference is still more striking.

§ IV.—*Special Chemistry of the Blood in Health and Disease.*

19. A simple method of determining some of the most important constituents of the blood has been recently given by Figuier.* It is based on the fact made known many years ago by Berzelius, that after the addition of a solution of a neutral salt to defibrinated blood, the corpuscles do not (as before) pass through filtering paper. On the addition of two parts of a solution of sulphate of soda, of spec. grav. 1·130, to one of blood, Figuier found that the whole of the corpuscles remained on the surface of the filter. The following are the steps of his analysis. The fibrin is removed by whipping, (in the ordinary manner,) dried and weighed; the weight of the corpuscles is ascertained by the method indicated, and that of albumen by coagulating by means of heat the filtered solution. The proportion of water is determined by evaporating a small known weight of the blood. The principal advantage of Figuier's method is the facility with which the most important constituents may be determined, without any very difficult chemical manipulations.

20. The next contribution to the chemistry of the blood that falls under our notice is the elaborate memoir of MM. Becquerel and Rodier.† As this is, without doubt, one of the most important chemical papers that has recently appeared, we shall give a tolerably full abstract of its contents. It is based on 160 analyses of the blood in health and disease, and is the result of eighteen months laborious and careful investigation. They arrange the memoir under three heads. In the first, they describe their method of analysis, and then proceed to notice, in a general manner, certain purely physical and chemical results deducible from the analyses of the blood. In the second, they lay down the general conclusion to which their analyses have led them, regarding the blood in health, pregnancy, and disease; and in the third they apply these general principles to the study of the blood in special diseases.

21. *First Series of Operations.* These are intended to ascertain, first, the density of the blood and of the serum; and second, the weight of the fibrin, of the corpuscles, and of the solid residue of the serum. In these steps they closely follow the method adopted many years ago by Dumas, and, like him, they assume that all the water in the blood appertains to the serum. They never use less than 11 or 12 ounces of blood for analysis. It is received in two separate vessels, one larger than the other. The blood in the smaller vessel is whipt, and the fibrin thus obtained is washed, dried, and weighed. The defibrinated blood is put by for

* Ann. de Chim. et de Phys., vol. ii. p. 503.

† Gazette Med. de Paris, Nos. 47, 48, 49, 50, 51, for 1844.

further analysis. The blood in the larger vessel is allowed to coagulate, the serum is carefully separated, and the clot (after its physical character has been duly noticed) may be thrown away.

A. A portion of the defibrinated blood is first weighed at a given temperature, 50° F., in a specific gravity bottle, and thus, by a simple calculation, the weight of the blood when defibrinated is obtained; and consequently the weight of the fibrin contained in 1000 parts of blood. This being effected, a known portion of defibrinated blood is weighed, dried, and then again weighed. In this manner the quantity of water is determined. By way of illustration, let us suppose that 100 parts of defibrinated blood yield 20 parts of solid materials, and 80 of water. The 20 parts of solid constituents are to be calcined, in order to determine the inorganic constituents, to which we shall revert presently.—*B*. The density of the serum being ascertained, a given quantity of it is dried, and then again weighed. The difference of the weight indicates the amount of water. Suppose, for instance, that 100 parts of serum yield 10 parts of solid constituents, and 90 of water. We have now all the requisite data for determining the weight of the corpuscles, and of the solid constituents of the serum contained in 100 parts of defibrinated blood. In fact, as all the water of the defibrinated blood is presumed to belong to the serum, we have the following proportions. If x represents the weight of the solid constituents of the serum contained in 100 parts of defibrinated blood, we have $90 : 10 :: 80 : x$, whence it follows that $x = 8{\cdot}8$; and if we subtract this from 20, the weight of the dried blood, we have 11·2 left to represent the weight of the corpuscles. Hence 1000 parts of blood contain,

Water . . .	800	Solid residue of serum .	88
Corpuscles . .	112		

The weight of the fibrin has been already determined, but is so slight relatively to the mass of the blood, that the trifling correction for it may be neglected.

Second Series of Operations. These are for the purpose of determining the extractive and fatty matters.

The serum, being carefully dried and pulverized, is treated several times with boiling water, till every thing that can be extracted by that menstruum is taken up. These are, (α) extractive and colouring matters, and (β) salts existing in a state of freedom dissolved in the serum. The serum thus extracted by water is dried and again weighed. The difference of weight indicates that of the above-named substances extracted by the water. The dried residue is then treated, to complete extraction, with boiling alcohol, which leaves an insoluble residue of pure albumen, which must be dried and weighed. The serolin, phosphorised fat, cholesterin, and saponified fat, may be separated from the alcohol by Boudet's method.

Third Series of Operations. These are conducted with the object of determining the weight of the iron, and of the various inorganic constituents. The blood is first reduced to a charred mass in a platinum crucible; it is then transferred to a porcelain crucible, in which it is exposed to a dull red heat for about an hour, at the expiration of which period the carbon is almost entirely removed. This is one of the most difficult steps of the analysis; for if the heat is too low the carbon

is not liberated: if, on the other hand, it is too high, the greater part of the chloride of sodium is lost. In fact, with all precautions, some chloride of sodium always escapes, and some carbon remains after calcination. This residual carbon is estimated in the following manner:—Suppose that the whole incinerated ash weighs 20 grains, we treated 4 grains with boiling hydrochloric acid, which dissolves all the saline matters, with the exception of silica, (which exists in extremely minute quantity in the blood,) and leaves the carbon, which is dried and weighed. The remaining 16 grains are used for the determination of all the other inorganic constituents: they are treated with distilled water, which dissolves the greater portion of them. The solution is filtered through a weighed filter-paper, which is then calcined. The small quantity of carbon present, which is known by the preceding operation, is burned off during the calcination. By those two operations are obtained a soluble portion and an insoluble portion. The soluble portion contains chlorides, chiefly of sodium, and some other saline substance, especially free soda, carbonates and sulphates of soda, and of potash and phosphate of soda. All that can be effected is to separate and weigh separately the chlorides on the one hand, and all the other soluble salts on the other hand. It would be very desirable, no doubt, to isolate and estimate each salt separately, but the quantity of blood obtainable at a single bleeding is much too small to admit of this being done, when the object is at the same time to separate all the organic elements of the blood. The quantity of the chlorides is estimated by nitrate of silver, it being assumed that chloride of sodium is the only chloride present, which is not far from the truth; and subtracting the weight of the chlorides from the soluble mass, the weight of the other salts is determined.

The insoluble residue contains the phosphates (almost exclusively phosphate of lime) and peroxide of iron. Boiling acetic acid dissolves out the phosphates. Wash, filter, and ignite the filter-paper, and weigh. The difference of weight represents that of the phosphates. The residue is merely peroxide of iron, whence the weight of iron in the blood is deduced, as, with most chemists, we assume that iron exists free in the blood. It seems impossible to extract a greater number of substances from the blood drawn at one bleeding than is done during the foregoing processes.

22. ON SOME PURELY PHYSICAL AND CHEMICAL RESULTS DEDUCIBLE FROM THE ANALYSIS OF THE BLOOD, CONSIDERED GENERALLY.

a. Latterly almost exclusive attention has been paid to alterations in the quality of the blood, without reference to modifications in its quantity. But it seems obvious that the quantity of blood must be liable to variation; and though such variations cannot be accurately estimated, yet chemical observations enable us, if not to prove, to render it in the highest degree probable, that they do occur.

b. It is impossible to estimate the density possessed by the blood while it is circulating in the system. The coagulation of the fibrin, which begins the moment the blood issues from the vessels, is an insurmountable obstacle to doing so. Their experiments on the chemistry of defibrinated blood lead then to conclude that its density is proportional to the weight of the globules. Hence, the greater the density, the richer is the blood in globules.

c. The density of the serum depends on the quantity of solid materials, especially albumen, that it contains in solution. But it is important to note that this relation does not always exist, because of the difference that in some cases exists between the relative proportions of the extractive and fatty matters, free salts and albumen, held in solution.

d. All the substances which exist free in the blood are generally quite independent of each other, as regard the variations to which they are liable. But in some exceptional cases, where the blood is greatly impoverished, the proportion of all those substances may be simultaneously lessened, though in different proportions.

e. The soluble substances, to which the term " extractive matters and free salts " is applied, are of too complicated a character to allow of any conclusions being drawn from them.

f. The analysis of the inorganic matters contained in the blood comprises, not only those which are free in that liquid, but also those that are constituent parts of the albumen, globules, &c. They have, therefore, separated the result of this analysis from that of the 1000 parts of blood.

g. In all their analyses they have isolated and carefully weighed the iron, and have thence come to the conclusion that the weight of the iron is very probably proportional to that of the globules. But as the number obtained by dividing the weight of the iron by that of the globules was not always exactly the same, but sometimes presented a difference of some thousandths, they do not positively advance this position as true.

h. The peculiar colouring matter of the serum varies in quantity, whence the various shades of colour observed in that liquid. This colouring matter has never been isolated, but its physical characters by analogy indicate that it is the colouring matter of the bile, or rather that the colouring matter of the bile is that of the serum, which is separated from it by the liver.

i. The absolute or relative excess of fibrin is almost always announced by the formation of the buffy coat; and in most cases where it does not form, the excess of fibrin is indicated by more or less abundant whitish striæ near the upper surface of the clot.

k. The properties of the clot depend generally on the relative proportions of fibrin and globules. When the globules abound, and the fibrin is in natural or considerable quantity, the clot is bulky, firm, and covered with a greyish coat, or is at least streaked with whitish striæ. The clot is small when the globules are few and the fibrin is relatively in excess; when the globules are in natural quantity or abundant, and the fibrin in natural quantity, the characters of the clot are so variable, that no rule as to its appearance can be established. It may be large or small, firm or soft, mixable with the serum or not, uniform or marbled in aspect, &c. The same is the case when the fibrin is slightly diminished in quantity. If the fibrin is much diminished, the clot is necessarily soft and diffluent.

23. *Composition of the Blood in the Healthy Man.* The men (eleven in number) from whom the blood for analysis was taken, were respectively aged—one, 21 years; two, 23; one, 24; one, 28; one, 33; one, 38; one, 53; one, 55; and one, 66. They were all bled for trifling causes, not affecting their general health.

The following table exhibits the maxima, minima, and average numbers of the different constituents, in 1000 parts of the blood of man :—

	Mean.	Maxima.	Minima.
Density of defibrinated blood	1060·2	1062·0	1058·0
——— of serum	1028·0	1030·0	1027·0
Water	779·0	800·0	760·0
Blood corpuscles	141·1	152·0	131·0
Albumen	69·4	73·0	62·0
Fibrin	2·2	3·5	1·5
Extractive matters and free salts	6·8	8·0	5·0
Fatty matters	1·600	3·255	1·000
Serolin	·020	·080	impond.
Phosphorized fat	·488	1·000	·270
Cholesterin	·088	·175	·030
Saponified fat	1·004	2·000	·700
From 1000 parts of blood, after calcination, they obtained—			
Chloride of sodium	3·1	4·2	2·3
Other soluble salts	2·5	3·2	2·0
Phosphates	·334	·7	·225
Iron	·565	·633	·508

24. *Composition of the Blood in the Healthy Female.* The eight women, from whom the blood for analysis was taken, were respectively aged—one, 22 years; one, 25; one, 26; two, 33; one, 36; one, 53; and one, 58.

The following table exhibits the maxima, minima, and average values of the different constituents:—

	Mean.	Maxima.	Minima.
Density of defibrinated blood	1057·5	1060·0	1054·0
——— of serum	1027·4	1030·0	1026·0
Water	791·1	813·0	773·0
Blood corpuscles	127·2	137·5	113·0
Albumen	70·5	75·5	65·0
Fibrin	2·2	2·5	1·8
Extractive matters and free salts	7·4	8·5	6·2
Fatty matters	1·620	2·860	1·0
Serolin	·020	·060	
Phosphorized fat	·464	·800	·250
Cholesterin	·090	·200	·025
Saponified fat	1·046	1·800	·725
From 1000 parts of blood, after calcination, they obtained—			
Chloride of sodium	3·9	4·0	3·5
Other soluble salts	2·9	3·0	2·5
Phosphates	·354	·650	·250
Iron	·541	·575	·486

From these numbers the following important deductions may be drawn:—

1. The limits within which the composition of normal blood varies are very narrow, and are probably dependent on constitutions, age, and diet.

2. The number for the corpuscles exceeds 127, which used to be regarded as expressing the physiological mean.

3. The number for the fibrin, 2·2, is below the number 3, that is usually admitted as the mean of that constituent.

A comparison of these figures, with those furnished by the analysis of healthy male blood, lead to some important conclusions; the most important of which are, that the numbers obtained in these eight analyses do not agree so closely as those obtained in the analyses of male blood, the difference between the maxima and minima being greater; that female blood contains more water, and a much smaller proportion of corpuscles, than male blood. In both sexes the cholesterin increases with advanced age, and the iron is proportional to the corpuscles.

The effects of menstruation on the blood are deserving of attention. From a careful analysis of the facts in their possession, they conclude, that before menstruation commences, the amount of corpuscles is below the normal female average of 127; if menstruation is imperfectly established, if it is incomplete and irregular, the corpuscles are below the average; as soon as the function is thoroughly established, the amount of corpuscles rises, and varies between 127 and 137; and at the cessation of menstruation the corpuscles again diminish: in one instance they were observed to fall to 113, and in another to 121.

25. *Of the Blood during Pregnancy.* The following table gives the maxima, minima, and average values of the different constituents of the blood of nine women in different stages of pregnancy, varying from the fourth to the seventh month.

	Mean.	Maxima.	Minima.
Density of defibrinated blood	1051·5	1055·5	1046·2
——— of serum	1025·5	1026·8	1023·6
Water	801·6		
Blood-corpuscles	111·8	127·1	87·7
Albumen	66·1	68·8	62·4
Fibrin	3·5	4·0	2·5
Extractive matters and free salts	6·6	8·7	4·7
Fatty matters	1·922	2·519	1·158
Serolin	variab.	·108	·018
Phosphorized fat	·646	·863	·381
Cholesterin	·061	·225	·030
Saponified fat	1·195	1·323	·737

From 1000 parts of blood, after calcination, they obtained—

Chloride of sodium	3·2	3·9	2·3
Other soluble salts	2·4	2·8	1·8
Phosphates	·425	·690	·282
Iron	·449	·490	·370

From a consideration of all their analyses, they conclude that the blood undergoes certain modifications, corresponding with the advanced state of pregnancy. The chief of these modifications are, a diminution of the corpuscles, and of the albumen, and an increase of the fibrin, of the phosphorized fat, and of the water.

Before proceeding to the subject of the blood in disease, I would observe that Becquerel and Rodier seem entirely ignorant of the labours of Simon, Nasse, Marchand, and Enderlin. In some respects this renders their labours the more valuable; while, at the same time, there are reasons why we could have wished that they were better acquainted with the proceedings of chemistry in Germany.

26. According to Simon, 1000 parts of blood contain—

	In the Male.	In the Female.
Water	791·900	798·656
Solid constituents	208·100	201·344
Fibrin	2·011	2·208
Fat	1·978	2·713
Albumen	75·590	77·610
Globulin	105·165	100·390
Hæmatin	7·181	5·237
Extractive matters and salts	14·174	9·950

According to Nasse,* 1000 parts of the blood of man contain—

Water	798·402	Albumen	74·194
Solid constituents	201·598	Blood-corpuscles	116·529
Fibrin	2·233	Soluble salts	6·622
Fat	1·970		

The soluble salts consisted of—		The insoluble salts consisted of—	
Alkaline phosphates	·823	Peroxide of iron	·834
Alkaline sulphates	·202	Lime	·183
Alkaline carbonates	·957	Phosphoric acid	·201
Chloride of sodium	4·690	Sulphuric acid	·052
	6·622		1·270

The insoluble salts and extractive matters are probably included in Nasse's analysis in the albumen.

The salts of the blood have been analysed by Marchand. They amount (he observes) to 6·28—6·82% of the dried residue. The four following analyses are given in his *Lehrbuch der physiologischen Chemie*, 1844.

	1.	2.	3.	4.
Chloride of sodium	3·91	3·42	3·81	3·82
Chloride of potassium	0·32	0·21	0·31	0·38
Carbonate of soda	0·62	0·52	0·72	0·61
Sulphate of soda	0·31	0·52	0·38	0·42
Phosphate of soda	0·56	0·72	0·68	0·59
Phosphate of lime	0·25	0·31	0·28	0·30
Phosphate of magnesia	0·21	0·20	0·25	0·28
Lactate of soda	0·32	0·28	0·35	0·34
Lactate of ammonia	0·12	0·10	0·00	0·08

According to Enderlin, 100 parts of the ash of human blood contain—

Tribasic phosphate of soda ($3\,Na\,O, PO_5$)	22·100	83·740 soluble salts.
Chloride of sodium	54·769	
Chloride of potassium	4·416	
Sulphate of soda	2·461	
Phosphate of lime	3·636	15·175 insoluble salts.
Phosphate of magnesia	0·769	
Peroxide of iron and phosphate of iron	10·770	

Hence Enderlin excludes both free alkalies and their carbonates: Nasse and Marchand exclude only the former: while Becquerel and Rodier, without apparently being aware that their presence has ever been called in question, admit them both.

27. *On Diseased Blood.* From a survey of all their analyses, Becquerel and Rodier deduce eight laws.

* Simon's Beitrage, p. 183.

First Law. The simple fact of the development of a disease, almost always modifies, in a notable manner, the composition of the blood.

The following table represents the mean composition of the blood in 120 cases of acute diseases:—

	Men.	Women.
Density of defibrinated blood	1056	1055
——— of serum	1027	1026
Water	800	804
Blood-corpuscles	125	118
Albumen	66	65
Extractive matters and free salts	7	7·5
Fatty matters	1·7	1·7
Serolin	variable.	variable
Phosphorized fat	·56	·60
Cholesterin	·11	·13
Saponified fat	1·00	·90

In 1000 parts of blood, after calcination, they found:—

Chloride of sodium	3·1	3·0
Other soluble salts	2·6	2·5
Phosphates	·45	·45
Iron	·50	·49

On comparing these numbers with the analyses of healthy blood, we observe a diminution of the density, both of the blood generally, and of the serum; a very marked diminution of the corpuscles, and a sensible, but not so strongly marked, diminution of the albumen; a slight augmentation of the fatty matters, in consequence of an increase in the phosphorized fat and cholesterin; and a marked increase in the phosphates. The fibrin has not been included in this table, because its variations are dependent on other influences than those of the mere disease.

Second Law. Venesection exercises a remarkable influence on the composition of the blood: the more marked, the oftener it is repeated.

This law is illustrated by the two following tables:—

Mean Composition of the Blood of Twenty Persons, bled Twice.

	1st Venesection.	2nd Venesection.
Density of defibrinated blood	1055·0	1051·2
——— of serum	1026·1	1025·3
Water	796·2	812·0
Blood-corpuscles	125·4	112·0
Albumen	66·2	62·5
Fibrin	3·7	3·8
Extractive matter and free salts	6·8	7·6
Fatty matters	1·657	1·560
Serolin	·027	·047
Phosphorized fat	·490	·465
Cholesterin	·178	·150
Saponified fat	·962	·900

1000 parts of blood, after calcination, yielded—

Chloride of sodium	2·8	3·4
Other soluble salts	2·7	2·5
Phosphates	·435	·417
Iron	·527	·488

Mean Composition of the Blood of Ten Persons, bled Three Times.

	1st Venesection.	2nd Venesection.	3rd Venesection.
Density of defibrinated blood	1056·0	1053·0	1049·6
——— of serum	1025·8	1026·3	1025·6
Water	793·0	807·7	823·1
Blood-corpuscles	129·2	116·3	99·2
Albumen	65·0	63·7	64·6
Fibrin	3·5	3·3	3·4
Extractive matters and free salts	7·7	6·9	8·0
Fatty matters	1·662	1·584	1·530
Serolin	·026	·088	·012
Phosphorized fat	·636	·489	·450
Cholesterin	·106	·156	·149
Saponified fat	·893	·851	·919
1000 parts of blood yielded, after calcination :—			
Chloride of sodium	2·8	3·5	3·0
Other soluble salts	2·6	2·5	2·7
Phosphates	·404	·493	·348
Iron	·513	·471	·468

Here we see that repeated venesections impoverish the blood, and render it more watery; slightly diminish the albumen; do not influence the fibrin, or extractive matters and free salts; slightly diminish the fatty matters, and produce a very marked and decided diminution of the blood-corpuscles. This is, in fact, the leading effect of bloodletting. The iron diminishes in a fixed ratio with the corpuscles; the salts are not affected.

Third Law. In a plethoric condition of the system, there is no relative increase in the number of the corpuscles, or, in fact, any other change in the composition of the blood; it is simply the mass of the blood that is increased.

The authors arrived at this law from an examination of the blood of six men and one woman, suffering from the ordinary symptoms of plethora; such as a florid countenance, full habit of body, frequent headache, vertigo, buzzing in the ears, &c.

Mean Composition of the Blood of Six Plethoric Men and of One Woman.

	6 Men.	1 Woman.
Density of defibrinated blood	1059·0	1059·0
——— of serum	1028·3	1028·8
Water	780·4	784·0
Blood-corpuscles	138·0	131·5
Albumen	72·3	75·1
Fibrin	2·4	2·1
Extractive matter and free salts	6·3	5·8
Fatty matters	1·555	2·150
Serolin	variable.	·025
Phosphorized fat	·433	·673
Cholesterin	·088	·114
Saponified fat	1·014	1·038
The salts yielded by the calcination of 1000 parts of blood, were—		
Chloride of sodium	3·7	3·5
Other soluble salts	2·9	2·8
Phosphates	·341	·334
Iron	·547	·544

A comparison of this table with the mean composition of the blood in health, will show that the blood in plethora exhibits no striking chemical peculiarities. The amount of fibrin in these cases was very irregular, varying from 3·5 to 1.

Fourth Law. A diminution in the amount of the corpuscles in 1000 parts of blood, characterizing the condition of the system to which we apply the term anæmia, frequently occurs in diseases, either as an essential character, as a complication, or as a sequence.

Anæmia occurs—(1) in chlorosis; (2) after repeated venesections, or copious hemorrhage; (3) as a result of any drain on the system, as, for instance, prolonged suppuration, diarrhœa, &c.; (4) as a consequence of lead-poisoning, and intermittents of long duration; (5) during convalescence after severe illnesses, accompanied with much prostration and debility; (6) in persons improperly or insufficiently fed; and (7) in persons residing in a damp and unhealthy locality.

Mean composition of the blood, in thirty-five cases, in which there was a marked diminution of the corpuscles:—

Density of defibrinated blood	1047·4	Extractive matters and free salts	8·0
——— of serum	1017·1	Fatty matters	1·806
Water	822·0	Serolin	variable.
Blood-corpuscles	94·7	Phosphorized fat	·663
Albumen	68·0	Cholesterin	·110
Fibrin	3·5	Saponified fat	·992

1000 parts of blood yielded, after calcination—

Chloride of sodium	3·5	Phosphates	·545
Other soluble salts	2·4	Iron	·366

Fifth Law. The development of an inflammatory disease modifies the composition of the blood in a remarkable degree; which is especially obvious in the great increase of fibrin.

The mean composition of inflammatory blood is given in the following tables:—

	Men.	Women.
Density of defibrinated blood	1056·3	1054·5
——— of serum	1027·0	1026·8
Water	791·5	801·0
Blood-corpuscles	128·0	118·6
Albumen	66·0	65·8
Fibrin	5·8	5·7
Extractive matter and free salts	7·0	7·2
Fatty matters	1·742	1·669
Serolin	·020	·024
Phosphorized fat	·602	·601
Cholesterin	·136	·130
Saponified fat	·984	·914

1000 parts of blood, after calcination, yielded—

Chloride of sodium	3·1	3·0
Other soluble salts	2·4	2·7
Phosphates	·448	·344
Iron	·490	·480

Here we observe a great increase in the amount of the fibrin and cholesterin; the former varying from 4 to 10, and the latter being almost doubled. The albumen is diminished.

Sixth Law. There are certain circumstances under which the fibrin may fall below the normal average, and, possibly, its physical characters be affected.

Becquerel and Rodier arrange these circumstances under two distinct categories.

The first category includes "intoxication," in the most general acceptation of the term; embracing typhoid, yellow, and intermittent fevers, the plague, the various exanthematous diseases, &c.; in fact, any intoxication produced by the passage of any foreign matter, either directly or by absorption, into the blood.

In the second category they place those cases in which there is a diminution of fibrin, arising from unhealthy and insufficient food; in fact, those conditions under which such affections as *purpura hæmorrhagica* are developed.

Seventh Law. When a secretion is either completely checked, or much diminished, we often find that the blood contains some of its most essential components in great excess. The occurrence of an excess of urea in the blood, in cases in which the functions of the kidney are affected, has long been known: Becquerel and Rodier have found, that when the biliary secretion is suspended or diminished, the amount of cholesterin in the blood is much increased.

Eighth Law. There are three diseases in which the albumen of the blood is notably diminished, viz., in Bright's disease; in certain affections of the heart, accompanied with dropsy; and in severe cases of puerperal fever.

The data upon which these laws are founded may be traced in the observations on the blood in individual diseases.

28. I. Blood containing an Excess of Fibrin: Hyperinosis.

(1.) *Phlegmasia alba.* In a case of this disease, occurring six weeks after delivery, in which the blood was analysed by Becquerel and Rodier, they found a considerable diminution of the blood-corpuscles (92·6) and an augmentation of the fibrin (4·2). The cholesterin was in excess (·223), and the phosphates were abundant.

(2.) *Pericarditis.* In a case of pericarditis with effusion, occurring in a woman aged 40 years, in which the blood was analysed by Becquerel and Rodier, the following results were obtained:—

	1st Venesection.	2nd Venesection.	3rd Venesection.
Density of defibrinated blood	1045·8	1042·4	1346·5
——— of serum	1023·0	1021·8	1024·3
Water	831·0		847·0
Solid constituents	169·0		153·0
Fibrin	2·3	2·3	3·4
Fat	1·094		
Albumen	53·0	51·0	60·4
Blood-corpuscles	105·0	92·0	78·0

In the first analysis, the phosphates were in excess (·684): in other respects the salts occurred in their normal proportions.

At the period of the third venesection, the heart symptoms were much alleviated. The most remarkable feature in the blood is the extreme

diminution of the albumen. There was no albumen in the urine.—*See Law* 8.

(3.) *Bronchitis.* Becquerel and Rodier have analysed the blood in eight cases of acute bronchitis, four males and four females.

The mean results are expressed in the following table:—

	Males.	Females.
Density of defibrinated blood	1056·7	1056·6
——— of serum	1027·1	1027·7
Water	793·7	803·4
Solid constituents	206·3	196·6
Fibrin	4·8	3·5
Fat	1·621	1·715
Albumen	64·9	68·8
Blood-corpuscles	129·2	115·3
Extractive matter and salts	5·8	7·3
The salts consisted of		
Chloride of sodium	3·2	3·3
Other soluble salts	2·9	2·8
Phosphates	·346	·309
Iron	·513	·479

Scherer* has published an analysis of the blood of a woman in the seventh month of pregnancy, who was suffering from bronchitis, and probably from tubercular phthisis. The serum had a specific gravity of 1022·69, and the blood consisted of—

Water	825·698	Blood-corpuscles	71·069
Solid residue	174·302	Extractive matters	20·178
Fibrin	4·568	Soluble salts	6·399
Albumen	70·636	Earthy phosphates	1·825

(4.) *Pneumonia.* Dr. Rindskopf† has made several analyses of the blood in pneumonia.

1. A young man, with a very severe attack of pneumonia; delirium, and all the signs of arachnitis. Two venesections were instituted during the last thirty-six hours. The first gave fibrin 5·4: the second was more perfect, and yielded—

Water	828·566	Soluble salts	8·302
Solid constituents	171·434	Insoluble salts	1·107
Fibrin	6·674	Extractive matters	5·248
Albumen & blood-corpuscles	150·103		

2. A man aged 60 years, who had suffered for a considerable time from chronic bronchitis and emphysema, was attacked with broncho-pneumonia. The blood, which was taken shortly before his death, consisted of—

Water	812·566	Albumen & blood-corpuscles	160·300
Solid constituents	187·434	Salts	10·930
Fibrin	12·726	Extractive matters	3·478

3. In the blood of a young man aged 19 years, suffering from pneumonia, Rindskopf found—

	1st Venesection.	2nd Venesection.
Water	775·448	783·944
Solid constituents	224·552	216·056
Fibrin	6·702	7·723
Albumen	79·021	65·744
Blood-corpuscles	122·097	120·682
Salts	9·201	10·416
Extractive matter	7·531	11·661

* Untersuchungen, &c., p. 87. † Canstadt's Jahrsbericht, 1844.

4. In a case of pneumonia after catarrh, the blood taken at the second, third, fourth, and fifth venesections was examined. In addition to the bleedings, tartarized antimony and calomel were administered. The patient recovered.

	2nd Venesection.	3rd Venesection.	4th Venesection.	5th Venesection.
Water	796·494	793·362	807·696	809·650
Solid constituents	203·506	206·638	192·301	190·350
Fibrin	5·919	7·715	10·384	8·155
Albumen and blood-corpuscles	173·605	169·883	165·960	160·522
Soluble salts	10·188	7·952	15·957	11·531
Insoluble salts	1·340	1·404		4·151
Extractive matters	11·454	19·684		5·991

5. In a case of pneumonia of four weeks' standing, accompanied with catarrh and delirium tremens, in which tartarized antimony was administered, and recovery took place, the following results were obtained:—

	2nd Venesection.	3rd Venesection.	4th Venesection.
Water	793·237	797·915	
Solid constituents	206·763	202·085	
Fibrin	7·893	9·087	9·478
Albumen and blood-corpuscles	157·916	164·451	
Salts	10·978	8·291	
Extractive matters	29·975	20·256	

Heller* has analysed the blood of a young man, aged 21 years, suffering from pneumonia, the left lung being perfectly hepatized. The colour of the blood was rather dark: as it flowed from the vein its reaction was perfectly neutral. The serum, after the separation of the clot, had an alkaline reaction, a specific gravity of 1025, and was of a darker yellow colour than usual, although there was no biliphæin present.

The blood was composed of 600 parts of clot, and 400 of serum. It contained, in 1000 parts—

Water	773·226	Blood-corpuscles	145·574
Solid constituents	226·744	Residue of serum	76·850
Fibrin	4·320		

Becquerel and Rodier have analysed the blood of five women suffering from pneumonia, two of whom were bled only once, while in three venesection was repeated. The mean composition of the blood is represented in the following table:—

	1st Venesection.	2nd Venesection.
Density of defibrinated blood	1052·6	1050·2
——— of serum	1025·0	1023·0
Water	801·0	808·0
Solid constituents	199·0	192·0
Fibrin	7·4	6·3
Fat	1·687	1·618
Albumen	61·1	59·7
Blood-corpuscles	122·5	113·9
Extractive matters and salts	6·4	7·4

The following salts were contained in 1000 parts of blood:—

Chloride of sodium	2·8	3·1
Other soluble salts	2·7	2·4
Phosphates	·308	·445
Iron	·493	·512

* Archiv fur Physiologische und Pathologische Chemie und Mikroskopie, vol. i. p. 4.

Zimmerman * has found the specific gravity of the blood in this disease as high as 1065.

Hoffmann † has recently made four ultimate analyses of dried pneumonic blood. In all these cases the blood was buffed.

	Ash.	Carbon.	Hydrogen.
A. 1st venesection . .	4·365	57·428	8·615
,, 2nd ,, . . .	4·081	52·280	——
B. 1st ,, . .	3·880	51·966	8·543
,, 2nd ,, . . .	3·784	51·149	7·832

These analyses are not sufficiently numerous to allow of our attempting to draw any conclusions from them.

Two analyses of the blood in pneumonia biliosa have recently appeared; one by Scherer,‡ the other by Heller.§

The individual whose blood was analysed by Scherer was a robust young man, aged 29 years. The clot was tolerably firm and tough, and covered with a greenish-yellow buffy coat: the serum exhibited a similar tint, and there was biliphæin in the urine. The conjunctiva was coloured yellow; and there was considerable gastric disturbance. The blood drawn at the first venesection yielded—

Water . . .	779·00	Albumen . .	72·26
Solid constituents . .	221·00	Salts	9·57
Fibrin . . .	9·70	Extractive matters .	4·83
Blood-corpuscles . .	124·60		

Blood was again taken, in consequence of further symptoms of congestion. It yielded—

Water . . .	785·00	Albumen . .	65·36
Solid constituents . .	215·00	Salts . . .	8·31
Fibrin . . .	9·40	Extractive matters .	9·67
Blood-corpuscles . .	122·26		

Three days after this venesection, the patient was again bled. The blood contained—

Water . . .	780·00	Albumen . .	69·83
Solid constituents . .	220·00	Salts . . .	7·63
Fibrin . . .	12·72	Extractive matters .	11·35
Blood-corpuscles . .	118·47		

The blood obtained by a fourth venesection yielded—

Water . . .	796·00	Fibrin . . .	8·87
Solid constituents . .	204·00	Blood-corpuscles . .	106·26

From this period there was a gradual amendment.

In Heller's case, the blood was taken from a robust man, aged 31 years. The clot was firm, and slightly buffed; the serum was of a deep yellowish-red colour, very alkaline, of specific gravity 1023, and on the addition of nitric acid a blue coagulum was formed, showing that biliphæin was present. The blood consisted of 521 parts of clot, and 479 of serum. It contained, in 1000 parts—

Water . . .	781·649	Blood-corpuscles .	147·114
Solid residue . .	218·351	Residue of serum (with biliphæin) . .	65·124
Fibrin . . .	6·113		

* Hufeland's Journal, 1844.
† Annal. der Chemie und Pharmacie, 1844.
‡ Untersuchungen, &c., p. 76.
§ Archiv, &c , vol. i. p. 2.

Heller observes, that he has often been able to detect biliphæin in the blood of pneumonic patients, when there have been no other indications of a disordered state of the hepatic functions.

5. *Pleuritis.* Becquerel and Rodier have analysed the blood of five men attacked with acute pleuritis. The mean composition of the blood is given in the following table:—

Density of defibrinated blood	1055·0	Fat	1·9
——— serum	1026·0	Albumen	65·4
Water	798·6	Blood-corpuscles	120·4
Solid constituents	201·4	Extractive matters and salts	7·6
Fibrin	6·1		

The salts consisted of—

Chloride of sodium	3·0	Phosphates	·478
Other soluble salts	2·0	Iron	·461

Here we see that the blood-corpuscles and albumen are considerably diminished, while the fibrin is increased.

6. *Peritonitis.* A case of peritonitis, in which the serum presented a milky appearance, has been recorded by Heller.* It occurred in a robust, but not corpulent man, aged 40 years. The blood, when first drawn, was of the ordinary colour, and, on standing, the clot and serum separated perfectly, the former not exhibiting a buffy coat.

In 1000 parts of blood there were—

Fibrin	4·72	Blood-corpuscles	80·13

In 1000 parts of serum there were—

Water	829·515	Albumen	108·791
Solid residue	170·485	Extractive matters and salts	11·222
Fat	50·473		

The fat was perfectly saponifiable with potash, and yielded no traces of cholesterin. After the separation of the clot, the serum exactly resembled milk. Its reaction was alkaline, and its specific gravity 1024·35. In the blood of a girl, aged 18 years, suffering from a slight attack of peritonitis, Becquerel and Rodier found a marked diminution of the blood-corpuscles, and an increase of the fibrin (5). The albumen remained normal, the phosphates and the cholesterin were increased. The serum was abundant, limpid, and yellow; the clot large and firm. In a woman, aged 24 years, attacked with metro-peritonitis, Scherer observed a tolerably large buffy coat, apparently more gelatinous than tough. The clot was rather large, but not very firm. The serum was neutral.

The blood contained, in 1000 parts—

Water	814·53	Blood-corpuscles	70·16
Solid constituents	185·47	Fat and extractive matters	6·02
Fibrin	5·32	Salts	7·13
Albumen	96·35		

In two days afterwards the blood contained—

Water	832·58	Albumen	100·25
Solid constituents	167·42	Blood-corpuscles	52·30
Fibrin	4·02	Salts and extractive matters	11·42

* Archiv, vol. i. p. 5.

The buffy coat had a more gelatinous appearance, and the serum was redder, than on the former occasion. Death occurred two days after the second venesection.

In a case of metro-peritonitis, in which the blood was analysed by Heller,* the clot was soft, and exhibited a well-marked buffy coat: the serum was clear, but of a deep yellow colour, and contained a large quantity of biliphæin. Its specific gravity was 1024. The blood consisted of 486·5 parts of clot, and 513·5 of serum, and contained—

Water	820·02	Blood-corpuscles	89·12
Solid constituents	179·98	Residue of serum (with biliphæin	85·08
Fibrin	7·78		

7. *Rheumatism.* Dr. Rindskopf† has analysed the blood of a woman suffering under rheumatism, accompanied with pneumonia. He found, in 1000 parts—

	1st Venesection.	2nd Venesection.
Water	809·973	
Solid constituents	190·027	
Fibrin	4·652	5·856
Albumen and blood-corpuscles	166·954	
Salts	12·188	
Extractive matters	6·233	

Becquerel and Rodier have analysed the blood of four men suffering from acute rheumatism. The mean composition of the blood is given in the following table:—

Density of defibrinated blood	1055·5	Fat	1·6
——— serum	1025·8	Albumen	66·9
Water	798·9	Blood-corpuscles	118·7
Solid constituents	101·1	Extractive matters and salts	8·1
Fibrin	5·8		

8. *Erysipelas.* The blood in a case of erysipelas of the hand, analysed by Rindskopf, yielded 7·71 of fibrin. The blood-corpuscles and other constituents were not determined.

In a case of erysipelas of the face, occurring in a young man aged 20 years, Heller found that the blood separated into 648·96 parts of clot, and 341·04 of serum. The clot was tolerably firm, and covered with a buffy coat. The serum was of a fawn colour, and turbid, in consequence of suspended hæmatoglobulin. It contained no biliphæin.

The blood contained, in 1000 parts—

Water	762·44	Blood-corpuscles	141·71
Solid constituents	237·56	Solid residue of serum	90·40
Fibrin	5·45		

9. *Phthisis.* Becquerel and Rodier examined the blood of nine persons affected with pulmonary phthisis, viz. five men and four women. The following table represents the mean composition of the blood of the men:—

	1st Venesection.	2nd Venesection.	3rd Venesection.
Density of defibrinated blood	1056·7	1055·5	1050·3
——— serum	1028·0	1026·3	1025·5
Water	794·8	799·8	821·0
Solid constituents	205·2	200·2	179·0
Fibrin	4·8	4·2	3·6

* Archiv, vol. i. p. 120. † Canstadt's Jahrsbericht, 1844.

	1st Venesection.	2nd Venesection.	3rd Venesection.
Fat	1·554	1.443	1·060
Albumen	66·2	65·0	62·0
Blood-corpuscles	125·0	122·7	103·5
Extractive matters and salts	7·7	6·7	8·9

Mean composition of the blood of phthisical women:—

Density of defibrinated blood	1055·4	Fat	1·729
—— serum	1028·2	Albumen	70·5
Water	796·8	Blood-corpuscles	119·4
Solid constituents	203·2	Extractive matters and salts	7·6
Fibrin	4·0		

10. *Febris Puerperalis.* The blood in this disease has been analysed by Heller.* It was of a very dark brown colour, but coagulated in the ordinary manner: the serum was turbid, but after standing for some time became clear; its reaction was alkaline, its specific gravity 1025, and it contained no biliphæin. The clot was dark, of a loose consistence, and covered with a strong buffy coat, over which there was a delicate membrane, that presented under the microscope a finely granular appearance, and fat-vesicles. In 1000 parts of blood there were contained—

Water	833·85	Blood-corpuscles	77·52
Solid constituents	165·15	Albumen & extractive matters	77·47
Fibrin	5·16	Fixed salts	6·00

The blood has been partially analysed in two cases of this disease by Becquerel and Rodier. In the first case the blood, taken at the first venesection, yielded fibrin (4·3), albumen (55·6), and blood-corpuscles (77·3): at the second venesection the fibrin was (4·2), the albumen (5·4), and the blood-corpuscles (66·6). The cholesterin and the phosphates exceeded the normal amount. In the second case the fibrin was normal, the albumen (43), and the blood-corpuscles (70).

11. *Convulsions.* The blood of a girl, aged 20 years, who frequently had forty or fifty attacks in the course of 24 hours, was subjected to several analyses by Heller.† The blood taken on the first occasion was of rather a dark colour; the clot was loose, and the serum was turbid and light red, in consequence of the presence of hæmatin: the specific gravity of the serum was 10·30, and the relation of the clot to the serum as 446,554.

The blood contained, in 1000 parts—

Water	797·00	Albumen, with extractive matters	96·05
Solid constituents	203·00	Fixed salts	8·35
Fibrin	6·00		
Blood-corpuscles	92·36		

A second venesection was instituted 33 days afterwards. The physical characters of the serum were much as on the former occasion, except that its specific gravity was only 1025. The blood was taken from the arm, and partly from the foot. The blood from the arm separated into 598·4 parts of clot, and 401·6 of serum, and was composed of—

Water	800·06	Blood-corpuscles	113·16
Solid residue	199·94	Residue of serum	82·35
Fibrin	4·44		

* Archiv, &c., p. 20. † Archiv, &c., p. 113.

The blood from the foot separated into 568·6 parts of clot, and 431·4 parts of serum, and was composed of—

Water	778·43	Blood-corpuscles	125·80
Solid constituents	221·57	Residue of serum	89·93
Fibrin	5·84		

In the blood from the foot, the clot was covered with a buffy coat of about two lines in thickness; in the blood from the arm there was no indication of that phenomenon. Heller likewise analysed the blood in a case of convulsions occurring a few hours after delivery. At the period of the venesection there were symptoms of metro-peritonitis and endometritis. The blood was of a tolerably bright red colour, and separated on coagulation into 587·3 parts of clot, and 412·7 of serum. The specific gravity of the latter was 1026, and it contained a large quantity of biliphæin. The blood contained, in 1000 parts—

Water	788·20	Blood-corpuscles	124·07
Solid residue	211·80	Residue of serum	81·86
Fibrin	5·87		

Two analyses of the blood, in an inflammatory disease of the eye, has been published by Dr. Ayres;* one previous to salivation, the other during it.

	Blood before Salivation.	Blood after Salivation.
Water	776·017	769·109
Fibrin	4·636	3·271
Albumen	78·805	70·150
Hæmatosine (Blood-corpuscles)	129·370	142·800
Crystaline and oily fatty matter	1·227	·431
Osmazome	·989	·890
Albumen combined with soda	1·311	1·748
Alkaline salts	6·021	5·504
Earthy phosphates	1·624	2·293

We observe that on the second venesection there is a diminution in the water, fibrin, albumen, fatty matter, osmazome, and alkaline salts, while the other constituents, especially the blood-corpuscles, are increased. Dr. Ayres would render better service to pathological chemistry, by increasing the number, and lessening the minutiæ, of his analyses of the blood. Such analyses as those of Lecanu, which have been taken by Dr. Ayres as his standard of comparison, include the separation of several substances, whose determination is of little real value or importance.

13. *Carcinoma medullare colli uteri.* The sanguineous discharge from the uterus of a woman, aged 34 years, presenting all the characters of intense anæmia, was analysed by Drs. Lenzberg and Morthier.† It was of a dark red colour, and the separation into clot and serum was not very perfect. There appeared, however, to be about 543 of the former, and 457 of the latter. The blood consisted of—

Water	832·46	Blood-corpuscles	77·03
Solid constituents	167·53	Residue of serum	74·06
Fibrin	16·44		

* Lancet, Jan. 4, 1845. † Archiv, p. 224.

Here we see that there is an enormous increase of fibrin, and a great diminution of the corpuscles, while the residue of the serum remains almost normal.

II. Blood deficient in Fibrin: Hypinosis.

29. *Typhoid Fever.* We may remind our readers that Andral and Gavarret, in their elaborate memoir on the blood, assert, the fibrin never rises perceptibly above the normal standard in true typhoid fever, and that it decreases in proportion to the advancement of the disease. Becquerel and Rodier have analysed the blood of 13 persons attacked with typhoid fever; viz., 11 men and 2 women. Of the 11 men, 6 were bled once, and 1 thrice; of the 2 women, 1 was bled once, and 1 thrice.

The following table exhibits the mean composition of the blood of the male patients obtained at the first venesection:—

Density of defibrinated blood	1054·4	Fat	1·8
——— of serum	1025·4	Albumen	64·8
Water	797·0	Blood-corpuscles	127·4
Solid residue	203·0	Extractive matters and salts	6·3
Fibrin	2·8		

The salts consisted of—

Chloride of sodium	2·9	Phosphates	·497
Other soluble salts	2·5	Iron	·555

The fibrin varied considerably, the maximum being 4·9, while in three cases it was considerably below the normal standard. The albumen and blood-corpuscles were, in most instances, diminished.

Four of the same men were bled a second time, and the following table gives the mean results of the blood obtained in these four cases, on both occasions:—

	1st Venesection.	2nd Venesection.
Density of defibrinated blood	1054·0	1051·4
Density of serum	1025·0	1024·7
Water	801·0	814·5
Solid constituents	199·0	185·5
Fibrin	2·3	1·3
Fat	1·5	1·4
Albumen	64·4	62·0
Blood-corpuscles	124·5	113·5
Extractive matters and salts	6·0	7·3

The salts consisted of—

Chloride of sodium	3·6	3·5
Other soluble salts	2·6	2·7
Phosphates	·544	·255
Iron	·581	·519

A comparison of the two columns shows that the blood obtained by the second venesection contains a considerably smaller mean amount of fibrin than the blood previously taken. The albumen and corpuscles are likewise diminished. The facts collectively are not much influenced, but the cholesterin in the second analysis was found to be much increased.

One man was bled three times. On the last occasion the water was augmented, and the corpuscles were further diminished. The fibrin was not

affected, being 2·3 on the first venesection, 2·3 on the second, and 2 on the third. The albumen was not affected, the fats generally were slightly diminished, but the cholesterin rose with each successive bleeding.

The analysis of the blood of the two women offered no peculiarity.

The clot in these analyses differed in respect to size and consistence, but presented none of the softness and diffluence on which the older writers laid so much stress.

Scherer* has made a partial analysis of the blood in a case of typhoid fever of a very low putrid type.

The blood was black and tar-like, and instead of forming a firm clot, became a soft mass, from which the serum did not separate. The little fibrin it contained was soft and gelatinous. The blood-corpuscles were jagged, and more or less injured: they were smaller than usual, and their nuclei were very distinct.

1000 parts of this blood yielded 176·3 of solid residue, which, on incineration, left 11·92 of fixed salts, consisting of—

Chloride of sodium	6·82	Carbonate of lime	0·16
Carbonate of soda	1·41	Phosphate of lime	0·60
Sulphate of soda	0·84	Sulphate of lime	0·22
Phosphate of soda	0·94	Peroxide of iron	0·60

30. *Simple Continued Fever.* The blood in this disease usually exhibits the character of hypinosis. The results obtained by Becquerel and Rodier do not, however, illustrate this character. These chemists analysed the blood of three men and two women suffering from ordinary continued fever. The mean composition of the blood of the three men is given in the following table:—

Density of defibrinated blood	1056·8	Fat	1·7
——— of serum	1025·5	Albumen	65·7
Water	781·6	Blood-corpuscles	142·4
Solid constituents	218·4	Extractive matters and salts	5·8
Fibrin	2·8		

Here we see that the fibrin and albumen remain nearly normal, while the blood-corpuscles, instead of diminishing, are slightly above the average, (their numbers being 146, 142, and 138). The fatty matters and salts offered no peculiarity. They give the following particulars regarding the blood of the two female patients:—

The corpuscles were augmented (135·5) in the first case, normal (125·5) in the second; fibrin normal (1·91) in the first, doubled (3·6) in the second; albumen normal (73 and 70) in both. The serum was turbid in both cases. In the case in which the corpuscles were 125, the clot was firm and resisting; in the other it was soft and diffluent.

31. *Spanæmia: Poverty of the Blood.*

(1.) *Carcinoma.* In a case of cancer of the left lobe of the liver, and of the pylorus, occurring in a man aged 53 years, Simon† found that the blood contained—

Water	887·2	Albumen	55·1
Solid constituents	112·8	Blood-corpuscles	45·8
Fibrin	3·0	Extractive matters and salts	8·9

The peculiar form of blood is, doubtless, to be attributed to the diseased condition of the principal blood-preparing organs.

* Untersuchungen, p. 69. † Beitrage, &c., p. 102.

(3) *Chlorosis.* The following table gives the mean composition of the blood of six chlorotic girls, as determined by Becquerel and Rodier:—

Density of defibrinated blood	1045·8	Fat	1·5
——— of serum	1028·1	Albumen	72·1
Water	828·2	Blood-corpuscles	86·0
Solid constituents	171·8	Extractive matters and salts	8·8
Fibrin	3·4		

The salts consisted of—

Chloride of sodium	3·1	Phosphates	·441
Other soluble salts	2·3	Iron	·319

From this table we perceive that, in chlorosis, the water is much increased, the blood-corpuscles are much diminished, the albumen is very slightly above the normal standard, the fibrin is rather above the healthy average, (in one case it rose to 5,) and the fatty matters and salts are normal. The iron, as usual, diminishes with the corpuscles.

The two following analyses were made by Herberger. The blood in (1) was taken from a chlorotic girl, aged 20 years; in (2) it was taken from the same girl after an eight weeks' course of chalybeates.

In both instances the blood formed a tolerably large clot, but no buffy coat.

	1.	2.
Water	868·340	867·080
Solid constituents	131·660	192·920
Fibrin	3·609	1·950
Fat	2·310	2·470
Albumen	78·200	81·509
Globulin	36·470	94·290
Hæmatin	1·590	4·029
Extractive matter and salts	8·921	8·236

The following observations of Andral* on the blood in chlorosis and other anæmic affections are deserving of an attentive perusal. "There are cases in which the amount of globules falls much below the physiological mean, and, diminishing more and more, reaches a proportion so low, that we can scarcely comprehend how, with so few globules in the blood, life can still be maintained.

"Thus diminution, in different degrees, of the globular element of the blood, is the fundamental character of anæmia; a condition which, therefore, in regard to the composition of the sanguine fluid, as well as in relation to its symptoms, is the opposite of plethora. According to the degree of the diminution of the globules, this condition is still compatible with a certain amount of health, or it becomes by itself a true morbid state, which may exist alone, or intervene as a complication in all diseases. Thus, then, independent of the solids, we find one of the principles of the blood becoming distinct from all the others, exercising, sometimes by its augmentation, and sometimes by its spontaneous diminution, an influence such as to become the point of departure, and the sole appreciable material element of a considerable number of diseases.

"I have found, as the average of the proportion of the globules, in 16 cases of commencing anæmia, the cipher 109; and in 24 cases of con-

* An Essay on the Blood in Disease, by G. Andral; translated from the French by J. F Meigs, M.D., and Alfred Stillé, M.D. Philadelphia, 1844.

firmed anæmia, the cipher 65. I have constructed these averag only from cases of spontaneous anæmia occurring in the human r e: I should have found a lower average in the sheep kind, which are also disposed to become anæmic, and which, in this condition, may have a blood so deficient in globules, that I have seen one of them which had but 15 of those corpuscles; whilst, in the human race, the lowest proportion of globules that I have ever met with in spontaneous anæmia is 28. It is true that man possesses normally in his blood more of the globules than does the sheep species; whence it follows that, proportionally to the physiological condition, the minimum, 28, of globules, found in the spontaneous anæmia of man, is very nearly equal to the minimum, 15, found in anæmic sheep. Besides, it is necessary to distinguish several kinds of anæmia, according to the modifications of composition that they produce in the blood. In spontaneous anæmia, whether strongly marked or not, the globules alone are diminished; the fibrin and the solid matter of the serum have preserved their normal proportions: thus, in 16 cases of slight anæmia, I have found, as the average of fibrin, the cipher 3·0; and in 24 cases of confirmed anæmia, the cipher 3·3.*

"In the anæmia which follows more or less abundant losses of blood, it may equally happen that we shall find the globules alone diminished; that is, indeed, the first effect of every hemorrhage; but if this augments or is renewed, there soon arrives a moment when the blood comes to lose equally its other principles, and we see the albumen and the fibrin of the serum diminish with the globules. It is in this way that in a woman who had suffered from very abundant attacks of metrorrhagia, the blood contained only 21 in globules, 1·8 in fibrin, and 61 of solid matter of the serum. The water had risen to the large proportion of 915. Anæmia may also be the result of certain inappreciable modifications of the organism which exercise an influence on the blood. In this case, the composition of that fluid appears to be the same as in spontaneous anæmia; that is to say, the globules alone are diminished, while the fibrin and albumen of the serum remain the same. This is what occurs in many pregnant women, whose blood loses its globules without losing its fibrin. The average of the globules is the same in them as we have found it in cases of slight anæmia.

"Why is it that woman is more exposed than man to this singular alteration of the blood, in virtue of which, without any evident cause, the globules of this fluid are thus diminished in so strong a proportion? Why is she particularly exposed to it at a certain epoch of her life?

"Yet men also are sometimes attacked with spontaneous anæmia; they present in such a case all the symptoms which characterize the chlorosis of the female: and I have proved that their blood then suffers the same alteration of composition: it is with them equally the globules alone which diminish; the fibrin and the solid matter of the serum remain the same. I have met with examples of this spontaneous

* The state of the blood of animals shows perfectly to what point the fibrin and the globules may remain isolated in their increase or diminution; thus the dog, whose blood contains much less fibrin than that of man, and of all other animals that I have examined, is precisely the animal whose blood is most rich in globules. On the contrary, the horse, the sheep, the ox, whose blood contains more fibrin than that of man, and especially than that of the dog, have in their blood much less of globules than the two other beings.—(See the *Memoire sur la Composition du Sang de quelques Animaux Domestiques, etc.*) Besides in the same species, those individuals who possess in their blood the most globules, are not those whose proportion of fibrin necessarily rises highest, and *vice versa*.

diminution of the globules both in young men, and in others aged from 40 to 60 years. When the influence of lead has acted for a long time upon the human constitution, there may result from it the production of a cachectic condition, very well described by Doctor Tanquerel: I have found that, in this condition, the globules of the blood suffer as great a diminution as in spontaneous anæmia; and, as in this latter, the fibrin and other elements of the blood preserve their normal quantity. This effect of the saturnine intoxication repeated or prolonged is very remarkable. It would be curious to know whether the globules, at the same time that they are diminished in quantity in anæmia, do not become altered also in their structure, and tend to undergo a true destruction. I announced, in my course at the Faculté in 1840—41, the results that some microscopic researches, undertaken with this view, have yielded me. It seemed to me, in two cases of chlorosis, that the globules were become smaller than we generally see them, and at the same time a certain number had no longer their accustomed form; they appeared, in the field of the microscope, as though broken and disseminated, like kinds of fragments. A young girl, who presented me this singular condition of the globules, on the 6th of December, 1840, was perfectly cured two months later; her constitution had even undergone such a metamorphosis, that it had gradually arrived, under our own observation, at a plethoric condition. The 14th February, 1841, I was obliged to bleed her; and her blood then presented me very beautiful globules, extremely different from those I had observed in December.

"These facts seem to me of so much interest and importance, as to make me feel the necessity of seeing them again, before accepting them definitely, and drawing deductions from them. The physical properties of the blood in anæmia are very well accounted for by the nature of the changes that it has undergone as to its composition.

"In the most ordinary condition, the one in which the only change undergone consists in a diminution of its globules, the blood presents to the naked eye the following appearance:—Supposing it to have flowed freely, we find in the vessel which has received it a small clot, which swims in the midst of an abundant and perfectly colourless serosity. This clot, far from being soft, as we might have expected, is, on the contrary, remarkable for its density; its molecules retain a strong power of cohesion, and it is not at all uncommon to find on its surface a very characteristic buff; one might take it for pleuritic blood, or for that of an acute articular rheumatism. This density of the clot and the buff which covers it, are the more marked in proportion as the anæmia is more considerable. The existence of cupped blood in anæmia is not a new fact in science. Borsieri, amongst others, had noticed the presence of the buff in the blood of chlorotic patients; and he had, with good reason, drawn from this an argument against those who pretended that this crust was always the necessary indication of a phlegmasia: and it is curious to find that Tommasini, who had also seen the coagulum of the blood of chlorotic patients become covered with a buffy coat, would not for that abandon the principle sustained by him, that there is no buff in the blood without inflammation; for, said he, chlorosis is nothing more than a chronic angioïtis. Such an assertion does not even require refutation.*

* Tommasini sull' Inflammazione, t. xi. p. 250, l. 278.

"I regard, as incontestable, the fact, that the clot of the blood of chlorotic patients is often buffed; and, like Borsieri, I have from this long since drawn the inference that the presence of the buff is not always evidence of the existence of an inflammatory disease, for chlorosis is certainly not of this character. But why is the blood in this disease often cupped? It is because the blood of chlorotic patients has retained all its fibrin, and lost some of its globules:—is it in consequence of this that there is really in this blood, as in that of inflammation, or as exists normally in the blood of some animals, excess of fibrin in proportion to the globules? Now, whenever this excess takes place, whether it be absolute or relative, and whenever, at the same time, the coagulation of the fibrin is not very much too rapid, this principle will be seen to accumulate alone on the surface of the clot, and the cup will appear. This is the reason why the blood of anæmic individuals may be buffed, and why plethoric individuals' is not. It is the cause, also, why the coagulum of blood is firmer and more dense in the first than in the last. It is also one of the circumstances which explains the constant existence of the buff in the blood of the horse. We must add to this, in the latter animal, the greater slowness of the coagulation of the fibrin. . . . . There is a phenomenon revealed to us by auscultation, which constantly coincides with a certain diminution of the globules; this is the singular bellows-sound heard in the heart, and especially in the arteries, in all cases of anæmia, however slight. For its manifestation, it is necessary that the impoverishment of the blood should have fallen upon the globules; it is not present when the fibrin alone has been diminished; so that I have never met with it in scorbutic patients, unless they had reached that period at which the globules, at first unaffected, yield in their turn. Neither have I met with this *bruit de souffle*, in the cases which will be detailed farther on, where the impoverishment of the blood is owing particularly to a diminution of the albumen of the serum. Remark, in addition, what the analysis of 88 cases in which this *bruit* existed in the carotid arteries, either continuously or intermittently, has taught me, in regard to the relation to be established between the diminution of the globules of the blood, and the appearance of the bellows-sound in the arteries.

"Of these 88 cases, there were 56 in which the souffle was continuous, and 32 in which it was intermittent. Of the 56 cases in which the *bruit de souffle* was continuous, and represented what M. Bouillaud has called the *bruit de diable*, I found 28 in which the cipher of the globules had not risen above 80, and had fallen even to 21; I found 13 in which the cipher varied between 80 and 100; 10 where it had risen from 100 to 115; and 5, again, where from 115 it had increased even up to 123.

"Of the 32 cases in which the *bruit de souffle* was merely intermittent, there were only 3 below 80 in globules, (76, 77, 77); 13 from 80 to 100; 8 from 100 to 115; 8 others from 115 to 126. We see then that the *bruit de souffle* of the arteries does not always show itself with the same degree of diminution of the cipher of the globules, in different individuals: there are, nevertheless, some rules to be established in regard to this, such as the following:—

"1. When the globules are so much diminished as to be below the cipher 80, the *bruit de souffle* exists in the arteries as a constant condition. I have not found a single exception to this law.

"2. When the globules remain above this cipher 80, the *bruit de souffle* may still show itself, but it is no longer constant. We continue to hear it not unfrequently while the cipher of the globules oscillates between 80 and 100: it is still heard, but much less frequently, in proportion as the cipher of the globules passes 100; and finally, is no longer observed, at least as dependent upon an alteration in the blood, when the cipher of the globules has risen above its physiological mean.

"Whatever be in other respects the nature of the disease in which the diminution of the globules exists, the *bruit de souffle* of the carotids does not the less show itself. I have verified it in the most opposite cases; in putrid fevers, in eruptive fevers, pneumonia, acute articular rheumatism, and in a great number of chronic diseases. But in all these cases it occurred only in connexion with the cipher of the globules above indicated.

"The *bruit de souffle* shows itself sufficiently often in pregnant women, which is in relation with the frequent diminution that the globules undergo in them.

"The intensity of the bellows-sound is commonly subordinate to the degree of diminution of the cipher of the globules.

"Thus, in 22 cases of chlorosis, I have found the intermittent *souffle* eight times, the cipher of the globules oscillating between 117 and 77; and the continuous *souffle* fourteen times, the cipher of the globules varying from 113 to 28."

Becquerel and Rodier analysed the blood of two girls in whom all the symptoms of chlorosis existed, (including the *bruit de diable* in the carotids,) and yet there was no diminution of the corpuscles, or of the solid constituents generally.

	1st Case.	2nd Case.
Density of defibrinated blood	1055·4	1055·4
—— of serum	1027·9	1027·2
Water	798·6	792·7
Solid constituents	201·4	207·3
Fibrin	2·9	2·3
Fat	1·287	1·980
Albumen	66·8	70·5
Blood-corpuscles	123·8	126·4
Extractive matters and free salts	6·6	5·8

The salts obtained by venesection consisted of—

Chloride of sodium	2·6	3·9
Other soluble salts	2·2	3·4
Phosphates	·329	·427
Iron	·492	·516

(3.) *Purpura hæmorrhagica.* The blood has been analysed in a case of this disease by Routier. In 1000 parts he found—

Water	795·244	Blood-corpuscles	121·701
Solid constituents	204·756	Residue of serum	83·405
Fibrin	0·905		

32. *Fourth Form of Diseased Blood; Heterochymeusis.*

(1.) Blood containing urea.

a. Morbus Brightii. Although, in the following analyses, Becquerel and Rodier failed in detecting urea in the blood, we have not deemed

that a sufficient reason for removing this disease from the present category.

A young man aged 22, a gardener, was attacked for the second time with œdema of the lower extremities, which he attributed to excessive work, to cold, and wet, and which he observed twelve days before he entered the hospital. At this period there was considerable debility, general anasarca, and a slow pulse, 52 in the minute. There was no apparent derangement of the nervous system, or of the digestive organs. The urine was highly albuminous, and became consistent on the addition of an acid. The first venesection was ordered on his admittance; the second six days afterwards, in consequence of a slight febrile reaction, for which no cause could be assigned.

In the blood drawn on the first occasion there was a slight decrease of the corpuscles (129), a marked diminution of the albumen (58). The fibrin was nearly normal (2·65): the fatty matters were abundant, (2·673), consisting of serolin ·05, phosphorized fat ·943, cholesterin ·589, and saponified fat 1·059. The salts offered no peculiarity: the serum was abundant, rather limpid, and of a yellowish-red colour: the clot was rather large and firm, and of an uniform colour. The blood taken at the second venesection exhibited a very considerable diminution of the corpuscles (97), and a much greater decrease in the albumen (51·8); fibrin and fatty matters nearly normal, being 2·8 and 1·56 respectively.

β. In the peculiar form of fever that occurred in Edinburgh two years ago, there was a considerable amount of urea detected in the blood.*

γ. Many observers have detected urea in the blood of persons suffering from cholera. An additional case has been lately recorded by Heller.†

The blood was collected from the carotids after death. It was fluid, with the exception of some coagula of fibrin in the heart and larger vessels. It was very dark coloured, and of very thick consistence. Under the microscope the blood-corpuscles were observed to be jagged at the edges, and more or less injured, and numerous fat-vesicles were visible. The amount of fibrin was very small; albumen and fat appeared to be in excess. There was a large amount of urea in the blood, in consequence of the torpidity of the urinary secretion. The fixed salts, especially the chlorides, were increased for the same reason.

(2.) *Cholæmia: Bile or its Constituents in the Blood.*

Becquerel and Rodier observe that icterus may exist under two perfectly distinct conditions: there may be a continuous and increased secretion and flow of bile, or there may be a perfect retention arising from biliary calculi, &c.

In the first case no peculiar modification is observable in the blood, and it is therefore unnecessary to quote their analyses: in the second case there is an accumulation of cholesterin and of the other fatty matters of the blood. The following analysis was made of the blood of a young man, aged 23 years, in whom icterus was developed as a consequence of indigestion. There was constipation, and no appearance of bile in the fæces. The blood contained, in 1000 parts—

Water	740·509	Albumen	66·300
Solid constituents	259·491	Blood-corpuscles	164·300
Fibrin	1·900	Extractive matters and salts	23·345
Fat	3·646		

* Taylor on the Blood, &c., Med. Gaz., p. 875. † Archiv, vol. i. p. 14.

The fatty matters (amounting to more than double the normal quantity) consisted of—

Serolin . . .	0·070	Cholesterin . . .	0·627
Phosphorized fat . .	0·810	Saponified fat . .	2·333

The fatty acids that enter into the composition of the saponified fat occur in the bile combined with soda. The salts were normal. In another case of a similar nature the fat amounted to 4·176, consisting of—

Serolin . . .	0·128	Cholesterin . . .	0·556
Phosphorized fat . .	1·159	Saponified fat . . .	2·333

In addition to the large amount of fat in the blood in these cases, Becquerel and Rodier observed that the serum was always tinged with bile-pigment.

Enderlin* states that he has twice detected choleate of soda (pure bile) in the blood. The particulars of the cases are not recorded.

(3.) *Piarhæmia: Fat in the Blood.* A remarkable instance of this form of morbid blood has been already recorded. See *Peritonitis.*

(4.) *Animalcules in the Blood.* Dr. Goodfellow has lately recorded a case in which an immense number of animalcules was found in the blood of a fever-patient. They varied in length from 1-5000th to 1-3000th of an inch; and in diameter, which was the same throughout, from 1-40,000th to 1-20,000th of an inch. Gruby and Delafond have described a peculiar animalcule, of frequent occurrence, in the blood of the dog; and Mayer, in his "Dissertatio de Organo Electrico et de Hematozois, Bonn, 1843," enumerates the following animalcules as occurring in the blood:—(1) Paramœcium loricatum seu costatum in frogs; and (2) Amœba rotatoria in fishes.

33. *On the Menstrual Discharge.* Rindskopf† analysed the menstrual discharge of a vigorous and healthy girl. It was extremely acid, and contained:—

	1st Analysis.		2nd Analysis.
Water	820·830	Water	822·892
Solid residue . . .	179·170	Albumen and hæmatoglobulin	156·457
Salts	10·150	Extractive matters and salts.	20·651

Vogel‡ analysed the menstrual discharge in a case of prolapsed uterus. It was of an intensely red colour, thick, and viscid; it did not coagulate, but, after standing for some time, a colourless serum separated. The fluid obtained at the commencement of the flux yielded 83·9 parts of water, and 16·1 of solid materials: and that obtained near the termination yielded 83·7 of water, and 16·3 of solid materials. The serum contained 93·53 parts of water, and 6·47 of solids, of which 0·64 were fixed salts.

No one who has carefully studied this secretion can doubt that fibrin is generally present. Its determination is, however, often impossible, in consequence of the vaginal mucus preventing the coagulation of the blood.

In the corresponding secretion in the mare, we succeeded in obtain-

* Annalen der Chemie und der Pharm., 1844.
† Canstadt's Jahrsbericht, 1844. ‡ Ditto.

ing 4·3 parts of fibrin from 36 grains of the clotted portion of the discharge. *

34. *Lochial Discharge.* Scherer has carefully investigated this subject. The following is a summary of his results:—

During the first day the discharge was of a brownish-red colour, viscid, and formed no coagulum; but, when collected in a vessel, threw down a slimy deposit, consisting of normal blood-corpuscles, with which a few partially dissolved and broken-up corpuscles, together with mucus-corpuscles, and epithelium scales were interspersed. The supernatant serum was clear and yellow, and the microscope revealed in it a large amount of fat-vesicles. It was devoid of odour, perfectly neutral, and contained, in 1000 parts—

Water . .	740	Solid constituents .	260

On the second day there were still blood-corpuscles, but they were fewer and less perfect, most of them being irregular and indented at the edges: there were mucus-corpuscles and epithelium scales, but in less number than on the preceding day. The fluid still deposited a viscid sediment, but the serum was more highly coloured than on the previous day. The reaction was neutral; there was a faint odour. 1000 parts consisted of—

Water . .	812·2	Solid constituents .	187·8

The residue, on incineration, yielded 9·35 of alkaline ferruginous ash.

On the third day the secretion resembled arterial blood. The blood-corpuscles were, for the most part, perfect, and normal mucus-corpuscles were observed. In 1000 parts there were—

Water . .	760	Solid constituents .	240

The ash amounted to 12·2. There was an appreciable quantity of fibrin in this day's secretion, arising, possibly, from a slight hæmorrhagic effusion.

On the fourth day the secretion was of a dirty brown colour, the corpuscles were more or less injured, and there was a distinct odour of ammonia. There were numerous mucus-corpuscles, but no epithelium.

1000 parts yielded 191 of solid residue, and 9·5 of alkaline salts.

On the fifth day the discharge was of a greenish-yellow colour. It contained very few blood-corpuscles, most of which were more or less injured, but numerous mucus-corpuscles, arranged in groups of 5—10 together. The reaction of the fluid was alkaline; there was a strong odour of ammonia, and 1000 parts yielded 93·5 of solid residue.

On the sixth day the fluid was of a brown colour, smelled like putrid cheese, and developed ammonia freely. 1000 parts contained 76 of solid residue.

For other analyses, and further information on this subject, the reader is referred to Scherer's "Chemische und Mikroskopische Untersuchungen zur Pathologie," Heidelberg, 1843.

35. *On the Passage of Metallic Salts, &c., into the Blood.* Kramer† has made some experiments on this subject. He examined the blood and the urine of patients and of animals, after the use of nitrate of potash, hydriodate of potash, chlorate of potash, chloride of barium,

* On the Theory of Menstruation, by G. F. Girdwood, Esq. Lancet, Dec. 7, 1844. An essay of a very high physiological character, and containing many original observations.

† Revue Scientif. et Industr., xiv. p. 34; and Berzelius's Report, &c., French edit. 1845, p. 374.

tartarised antimony, sulphuret of mercury, chloride of silver, nitrate of silver, carbonate of iron, sulphate of iron, and iron rust. All these, without exception, were detected in the blood and in the urine, with the exception of the chloride of silver, in which case silver was found in the blood, but not in the urine.

M. Œsterlen* has made a number of experiments for the purpose of ascertaining whether metallic mercury, when rubbed on the skin, and given internally in a state of fine division, enters the body in a metallic state. For this purpose he both rubbed mercurial ointment on the shaved skins of animals, and administered a certain quantity of the metal internally. In both cases, he found globules of mercury, from the 250th to the 1000th of a line in diameter, in the blood. The mucous contents of the colon also contained distinct globules of mercury. Metallic globules were also detected in the mesenteric glands, in the liver, spleen, lungs, kidney, in the bile, and in the urine; they were also found in the cavities of the heart. The author also states, that he detected metallic globules in the saliva and urine of a woman who was salivated by mercury. From his experiments he concludes that, in general, small quantities of mercury, introduced by friction or by the stomach, are thrown out of the system by means of the urinary and biliary secretions.

M. Audouard† has examined the saliva and urine of persons taking chloride of mercury, and in both liquids obtained the metal. He remarks, that Orfila's method of saturating the fluid with chlorine gas, precipitating the mercury on copper slips, and separating it from them by distillation, gives the most accurate results.

Heller‡ relates cases in which he discovered iodine and bromine in the blood, urine, saliva, nasal mucus, tears, &c., of syphilitic patients, to whom those remedies were being administered. He likewise records a case§ in which he sought unsuccessfully for silver in the blood of an epileptic patient to whom nitrate of silver had been administered for five weeks, in doses varying from 1 to 3 grains daily. A critique upon his analysis may be found in the Lond. Med. Gaz., May 15, 1845.

36. *Lymph.* Nasse‖ has recently analysed the lymph collected from the absorbent vessels of the neck of a horse. He obtained, in 1000 parts—

Water	950·000	
Solid residue	50·000	
Albumen, with fibrin	39·111	
Water-extract	3·248	
Spirit-extract	0·877	
Alcohol-extract	0·755	
Ethereal extract	0·088	
Oleate of soda	0·575	
Carbonate of soda	0·560	
Phosphate of soda	0·120	5·611
Sulphate of potash	0·233	
Chloride of sodium	4·123	
Carbonate of lime	0·104	
Phosphate of lime, with some iron	0·095	
Carbonate of magnesia	0·044	0·310
Silica	0·067	

* L'Experience, 1st Aug. 1844; and Edin. Med. and Surg. Journal, Oct. 1844.
† Journal de Chim. Med., ix. p. 137; and Berzelius's Report, p. 374.
‡ Archiv fur physiologische und pathologische Chemie und Mikroscopie, vol. i. pp. 30, 38.
§ Op. at page 9.
‖ Wagner's Handworterbuch der Physiologie, art. Lymph, vol. ii, 1845.

It yielded no microscopic indications of urea. Nasse compared the lymph with the serum from the blood of a healthy horse, and found a remarkable coincidence in the salts of the two fluids.

	Serum.	Lymph.
Alkaline chlorides	4·055	4·123
Alkaline carbonates*	1·130	1·135
Alkaline sulphates	0·311	0·233
Alkaline phosphates	0·115	0·120
	5·611	5·611

The lymph, therefore, is a dilute serum; and the salts of the blood which make their escape along with the colourless *liquor sanguinis* from the capillaries, either return again, in the same proportions to each other as they were secreted, into the capillaries; or, which is most probable, they only penetrate into the lymphatic vessels. Besides there being more water in the lymph than in the serum (in the ratio of 950 to 922), the two fluids differ in the ratio of their solid constituents to the salts: in the lymph, the salts amount to 11·22, and in the serum to 9·65% of the solid residue. It is, probably, this circumstance that causes the much greater viscidity of the serum, which is by no means solely dependent on the larger quantity of albumen in solution.

37. *Chyle.* Nasse† has instituted the following analysis of the chyle of the cat. It contained, in 1000 parts—

Water	905·7	Chloride of sodium	7·1
Solid constituents	94·3	Other soluble salts	2·3
Fibrin	1·3	Iron	traces
Fat	32·7	Earthy salts	2·0
Albumen, blood-corpuscles, and extractive matters	48·9		

§ IV.—*Secretion.*

The following observations on the chemical laws that govern secretion are worthy of attention. They are extracted from the 'Chemistry of Vegetable and Animal Physiology' of Mulder.

"It is a property of the chemical forces which are active in any substances to excite analogous forces in others. We notice this especially in organic nature, and it is nowhere more strikingly illustrated than in the nutrition of animals. Blood, a homogeneous fluid, circulates through very different parts of the body. In the muscles it sustains muscles; in the liver it supplies the component parts of the liver, and from it the bile is there secreted; in the kidneys it maintains their various parts, and secretes the urine, &c. None of these secretions appear in the blood with their peculiar qualities; of some there is not even a trace found in it. But the four organic elements of the whole are to be found in protein and its modifications, in the colouring matter of the blood, &c. The elements of the protein might no doubt be transposed to the liver, &c. by means of catalysis, and so the component parts of the liver and bile be produced from it. It would only be necessary then that the constituent parts of the liver should be put in contact with the component parts of the blood, and the forces of affinity resident in the substance of the liver would not require to influence those in the protein, or to produce any chemical alterations in its component parts. Other changes, however, ought undoubtedly to be considered. For instance,

* The oleate of soda is calculated as a carbonate.

† Wagner's Handworterbuch, &c., art. Chyle, vol. i.

a change in its component parts takes place in the liver itself, and, from the first, chemical forces actively operate therein: for a continual change of its component parts is a chief characteristic of every living organic substance. These forces may disturb the chemical equilibrium of other substances, and cause the formation of new products. If the constituents of the blood, the combinations of protein, the colouring matter, &c. enter the liver when it is in a state of action, and are there put in contact with the bile during its secretion, and with the substance of the liver itself, which is in a state of continual alteration, then the result will be, that this change of their component parts having taken place, the action will be transferred to the elements of the blood, and will maintain the secretion. If, on the other hand, the constituents of the blood are in a continual change, then the circle of action in which they are involved will extend to the mass of the liver, and so with every organ.

"We have, however, no more knowledge of the manner in which this secretion originally commences—whether it proceeds from the blood, or from the secreting organ, or whether each of these contributes its part, than with the manner in which the first germ of the whole organ, the liver, is produced, or in which the germ of the animal is converted into the animal. But the continuance of the action—the duration of secretion—entirely corresponds with some other phenomena which we may observe separately, and which therefore throw light upon these animal actions. This is the case especially with fermentation, from which Liebig has drawn many illustrations, for the purpose of clearly exhibiting his ideas; and with the same view we shall also avail ourselves of the same process. Yeast changes sugar into carbonic acid and alcohol, and is at the same time changed itself. The latter change causes the former, and is only transferred to the sugar. If we substitute blood for yeast, and the liver for sugar, we may form an idea, more or less, of the secretion of the bile. The component parts of the blood are continually undergoing change. This constant change of the component parts in organic bodies is a chief cause of the continuation of their existence. The liver, without intermission, assumes new parts, and loses others. This process we call nutrition. At the same time that the parts of the blood in the substance of the liver are thus undergoing change, chemical forces are excited; these forces are transferred to the elements of the blood, and so are enabled to produce from them the bile. This takes place the more easily, as the blood itself is also in a state of continual alteration, and thus readily yields to the impulse which, in some way or other, is communicated to it. As the impulse varies so does the effect. Hence that great diversity in the secretion of very dissimilar substances which are in a state of alteration, from the same fluid, that is, the blood, which is itself at the same time in a state of decomposition. From the nutrition of the cellular texture, however, which must be produced from the component parts of blood, and from the nutrition of all the secreting organs—which, besides producing the secretion, maintain themselves by separating what they require from the constituents of the blood—we learn that catalysis cannot be left out of consideration in the mere process of nutrition. Further, we must apply the same principle to all the solid parts of the body which are compounds of protein. The muscles, for instance, have the property of secreting protein from blood, and converting it into fibrin; on the other hand, when protein is deficient in the blood, this fibrin is taken from the muscles,

and converted into blood-protein, as in cases of long continuance and in emaciation. Muscles have thus the property of forming muscle-fibrin by simple contact, if protein abounds in the blood; and this result can be ascribed only to a cause similar to that by which crystals gradually accumulate from solutions of salts. It is at least a peculiar action, different from ordinary chemical action, which takes place when the plasma of blood is transformed into muscles, which in composition do not essentially differ from the plasma. The same is the case with the production of hair, nails, and permanent bones."*

§ V.—*The Fluids connected with the Chylopoietic Viscera, and Digestion.*

38. *Saliva.* Enderlin† has made numerous analyses of the ash left fter the incineration of the saliva, and has always found them to have the same constituents. He considers that its alkaline reaction is due to the tribasic phosphate of soda ($3NaO, PO_5$) which retains the mucus, and protein-compounds in solution. Enderlin observes that independently of conclusions deduced from the ash, he has sought unsuccessfully, in a direct manner, for lactates in the saliva. On incinerating salivary mucus obtained by washing that constituent from a filter, the residue is found to consist of phosphate of lime with traces of chloride of sodium and phosphate of soda, the same composition as the tartar that collects on the teeth.

A quantitative analysis of the ash obtained from a large quantity of saliva obtained from different persons, yielded the following results :—

A. *Constituents soluble in water.*

Tribasic phosphate of soda ($3NaO, PO_5$)	28·122	92·367
Chlorides of sodium and potassium	61·930	
Sulphate of soda	2·315	

B. *Constituents insoluble in water.*

Phosphate of lime		5·509
,, magnesia		
,, peroxide of iron		

He conceives that the large amount of soluble salts, (especially of tribasic phosphate of soda), as well as the occurrence of phosphate of iron in the saliva, indicate that the saliva takes an active part both in the chemistry of digestion and in the formation of blood.

Donné‡ observes in regard to the saliva that, "as it occurs in the mouth, it is not a simple fluid; it is always mixed with a larger or smaller amount of buccal mucus, and it is to this circumstance that we must attribute the great diversity of opinions that has been expressed respecting the chemical reactions of that fluid. In its normal state, saliva is alkaline, but the secretion of the mucous membrane of the mouth is acid, and thus the reaction of the saliva may be masked by that of the mucus. For instance, when there is much mucus in the mouth as occurs in some persons on waking, the reaction is acid; if, on the other hand, the mouth be rinsed and the flow of saliva stimulated by mastication, the

* Versuch. einer Allgem. Phys. und Patholog. Chemie, p. 27; or Fromberg's English Translation, pp. 38-40.

† Liebig, Annalen, 1844. p. 3 and 4. ‡ Cours de Microscope, p. 209.

reaction is alkaline in healthy persons.....Instead of being alkaline, the saliva may be neutral or faintly acid; this is especially the case in affections of the stomach and intestinal canal. I have observed it acid in patients with gastritis, and in children with aphthæ. As the health becomes established, the saliva regains its alkalinity. In a normal state, the evaporation of a drop of saliva gives rise to a beautiful crystalline arrangement, similar in form to hydrochlorate of ammonia. By means of this characteristic, an excellent observer, M. Lebaillif is able to tell his morning visitors whether they have breakfasted or not: for the morning saliva, before its secretion has been excited by eating, is mixed with a large number of epithelium scales which hinder the elegant and regular formation of the crystals."

39. *Bile.* The chemistry of the bile remains, as it has long done, in a most unsatisfactory state of confusion. Demarçay, in the year 1838, published an elaborate paper on this subject, in which he showed that the old opinion that the bile is a soda-salt, is, after all, correct, and that the essential constituents are an oily acid, which he terms *choleic*, and soda which exists in a state of combination with it. The subject has since been investigated by Berzelius and Liebig. The former chemist regards *bilin*, a neutral constituent, as the essential and most important ingredient, while the latter supports Demarçay's views with some trifling modifications. The following analysis of ox-gall will give some idea of this fluid. according to Berzelius*:—

Water	928·380
Solid constituents	71·620
Bilin	50·000
Chloride of sodium, lactate of soda, and extractive matter soluble in alcohol	15·000
Alkaline sulphates and phosphates, and extractive matter insoluble in alcohol	4·334
Cholesterin	·001
Mucus	2·350

The following observations on the recent progress of the knowledge regarding the bile are taken almost *verbatim* from the report of Berzelius for the year 1844, and it must not be forgotten that this is one of those disputed points on which Liebig and Berzelius hold very strong opposite opinions.

"Dr. Kemp has communicated some experiments which appear to have been made in Liebig's laboratory, and their object seems to be to prove that the bile is principally composed of a mere simple solution of a salt of soda, the acid of which he terms *bilic acid*. His experiments consist in separating, by means of alcohol and ether, the mucus, the fat, and the salts insoluble in alcohol; in evaporating to dryness, and in determining the carbon and hydrogen by combustion. In this manner he obtained 58·46—58·8% of carbon, and 8·3—8·81% of hydrogen, and by incineration in an open crucible 11·16% of carbonate of soda, and 0·54% of chloride of sodium. Subtracting the chloride of sodium and the soda, there remain 64·85% of carbon and 9·4% of hydrogen. In other analyses he found 3·4—3·7% of nitrogen. He asks, "What is this bilic acid? It is not the bilin of Berzelius, for carbonic acid does not separate the soda; he convinces himself of this fact by passing a current

* Wagner's Handwörterbuch der Physiologie, 1842. Art. Galle.

of carbonic acid through an alcoholic solution of the combination of this acid with soda, and not obtaining a precipitate of carbonate of soda. It is not the biliary resin of Thénard, for it is soluble in water. It is not Demarçay's choleic acid, for that is precipitated from a solution of its soda-salt by acids, even by weak vegetable acids. Dr. Kemp endeavours to refute my idea respecting the sweet taste of bilin (I attribute it to the glycerin produced by the saponification of the fat contained in the bile,) by submitting it to dry distillation, without detecting the odour of acrolein amongst the products of distillation. He seems to have forgotten that the acrolein must of necessity have been decomposed by the ammonia simultaneously developed, and that consequently a small amount of acrolein would escape observation.

"If it were asked, what light have these experiments of Dr. Kemp thrown on the composition of the bile? we could only reply that he had determined the proportions of carbon, hydrogen, and nitrogen, in that portion of the bile which is soluble in alcohol, and from which ether had removed everything soluble in that menstruum; but he gives us no idea of the nature of that portion, whether it is a simple substance or a mixture of various ingredients.

"Liebig has published a memoir on the bile, based on these experiments, and he arrives at a conclusion very analogous to that of Dr. Kemp, that the bile is principally formed of a single acid, *bilic acid*, in combination with soda; but he differs from Dr. Kemp in this respect, that he considers this bilic acid as identical with Demarçay's choleic and my bilifellinic acid. In order to prepare this acid, he recommends that 1 part of effloresced oxalic acid should be dissolved, with the assistance of heat, in an alcoholic solution of 8 parts of dry bile, from which the colouring matter has been previously removed by animal charcoal. Immediately on the dissolution of the oxalic acid, minute crystals of oxalate of soda began to separate, and their quantity increases on cooling. As soon as it ceases to deposit crystals, the liquid is filtered, diluted with water, and digested with carbonate of lead, until there is no longer any reaction of oxalic acid. The lead is removed by means of sulphuretted hydrogen, and the filtered solution is evaporated to dryness on the water-bath. The residue is bilic acid. This substance may also be obtained by dissolving bile in cold absolute alcohol, and saturating with dry hydrochloric acid gas. The whole of the soda of the bile may be considered as separated when no further crystalline precipitate results on mixing with ether. After the separation of the salt, the greater portion of the hydrochloric acid is expelled by evaporation on the water-bath.

"On the addition of water the residue separates into two distinct strata, one aqueous and very acid from the hydrochloric acid, while the other (the lower) is thick, and contains bilic acid. This bilic acid is dissolved in alcohol, and finely powdered oxide of lead is gradually added to the solution until the liquid indicates a faint excess of lead. The fluid is then filtered, and, after the separation of the lead by sulphuretted hydrogen, is evaporated to dryness.

"Now in the first of these experiments Liebig neglects all the constituents of the bile insoluble in alcohol; in the second he overlooks the action of warm hydrochloric acid on the elements of the bile, and that it gives origin to hydrochlorate of ammonia, taurin, and resinous acids. This is the body which, according to Liebig, is combined with soda in

the bile, and constitutes the essential and characteristic element of that secretion. He has not examined whether the oxide of lead will convert it into a plastic-like compound and bilin, and whether he could thus obtain fellinic and cholinic acid in the manner that I have described.

"As far as my own experiments on ox-bile are concerned,—Liebig asserts that the substance termed by me bilin is merely bilate of soda; that the sulphuric acid which I make use of does not separate all the soda contained in the bile, and consequently that the substance not precipitated by oxide of lead is bilate of soda. When a certain quantity of bilin is separated, and after the removal of the oxide of lead and of the acid, we may extract fellinic acid from the latter, and reduce the residue which is insoluble in ether into ordinary bilifellinic acid. On this point Liebig remarks that "the substance termed fellinic acid by Berzelius appears to be nothing else than a mixture or combination with bilic acid," and he adds that "cholic and bilicholic acid, bilicholinic and bilifellinic acids, fellanic and cholanic acids, do not refer to peculiar well-characterized bodies, but only represent certain changes which the organic portion of the bile has undergone by decomposition."

"The bilin that remains in solution after the bile has been precipitated by subacetate of lead, is, according to Liebig, merely bilate of lead dissolved in an excess of subacetate of lead, &c.

"M. Berlin, of Stockholm, who visited the Giessen laboratory last year, brought me back a specimen of bilic acid. By means of ether, I extracted from it traces of cholesterin, and of fellinic acid, which were easily separated by means of carbonate of soda. I then dissolved the acid in water, and precipitated it by sulphuric acid; the acid then assumed the form of a thick faintly-yellow syrup, while some white flocculi remained in suspension, which were collected on a filter, and proved to consist of one of the resinous pulverulent acids. The quantity in my possession was too small to admit of a complete examination, but judging from the solution of these white flocks in a weak solution of carbonate of soda, to which they communicated a bitter taste, I conclude that they were cholic acid. This bilic acid, morever, contained soda, which remained in combination with the sulphuric acid in an acid solution.

"On precipitating the bilic acid with sulphuric acid, redissolving in water, and treating it with oxide of lead, I obtained a plaster-like combination of lead, and bilin in solution. After evaporation, I obtained a residue of clear and colourless bilin, whose aqueous solution yielded no precipitation, either with sulphuric or hydrochloric acid. Ultimately, the bilin underwent its ordinary metamorphoses, and its solution contained ammonia and taurin.

"On treating the plaster-like compound of lead with ether, I obtained fellinic and cholinic acids; the residue was bilifellinic acid, which admitted of similar decomposition.

"From Dr. Kemp's analysis, Liebig concludes that bilic acid is identical with Demarçay's choleic acid. Dr. Kemp maintains that in this Liebig is committing an error at his expense, for which, when he publishes his further researches on the bile, he will call him to 'a severe account.'"

MM. Theyer and Schlosser have subsequently published an account of some new researches on the bile, which were made in the Giessen laboratory, and confirm the accuracy of Liebig's previous conclusions.

They terminate their memoir with the conclusion, that the picromel

of Thénard, the bilic acid of Kemp, the biliary sugar of Gmelin, the choleic acid of Demarçay, and my bilifellinic acid with bilin, (supposing the latter to be free from an alkali,) are one and the same substance.

"Now I would ask these young chemists (who have so well obeyed their master's orders in endeavouring to prove that I have described one and the same body under two different names, as if it were really formed of two distinct substances), what light they can throw on the following points.

"I would inquire, 1st, if fresh filtered bile, from which the mucus has been previously thrown down by acetic acid, and to which sulphuric acid diluted with an equal weight of water has been added, without any precipitation of bilic acid, after twelve or even twenty-four hours, (whatever quantity of acid may have been added); if, I say, such bile can be precipitated by subacetate of lead, without a considerable portion of Thénard's picromel or Gmelin's biliary sugar escaping precipitation, and remaining in solution. For my own part, I feel assured that no bile of this nature has been examined in the Giessen laboratory; and before we attempt to form conclusions regarding the composition of the bile, as it exists in the living body, we ought, at any rate, to employ fresh bile in our analyses.

"2d. When they have precipitated their bilic acid from its aqueous solution by sulphuric acid, and have thoroughly purified it from all extraneous matters, I would ask them to introduce the acid while still soft, and minutely divided, into a flask containing ether, and to examine if, in the course of twelve or twenty-four hours, the ether is not divided into two distinct portions,—one of which is fluid, while the other forms a thick syrup. This being granted, to distil the ether, to examine the residue, and then to see (according to my method) whether the ether has not extracted bilic acid, as well as fellinic and cholinic acids.

"3d. Let them dissolve in water the portion insoluble in ether, add a little carbonate of lead, so as to saturate any retained sulphuric acid, and then heat the solution on the water-bath, with finely-powdered litharge, which must be added in small portions as long as it agglutinates. When, after the lapse of a quarter of an hour or half an hour, the last portion is found not agglutinated, let them filter, evaporate to dryness, dissolve in anhydrous alcohol, again evaporate, and then see if the limpid and colourless matter which constitutes the residue, and which I call bilin, is bilate of soda. For this purpose, let them dissolve the residue in water, and mix the solution with sulphuric acid diluted with its own weight of water, or with hydrochloric acid; let them see whether the bilic acid is precipitated, its distinguishing character being that it is insoluble in acids but soluble in water; let them digest the acid solution for some hours at 140° and 180°, decant it from the deposited bilic acid, and examine whether the liquid does not contain ammonia and taurin—two bodies that are inevitably produced during the metamorphosis of bilin into bilic acid.

"4th. Let them separate, by one of the known methods, the bilic acid from the plaster-like compound of lead, and examine whether, by submitting this acid to similar treatment, they cannot obtain the same products; and, finally, let them publish to the world the results at which they arrive."*

* Rapport Annuel sur les Progrès de la Chimie, 1845, pp. 337-382.

In an essay on the bile, by Platner, published in Müller's *Archiv*, No. 2, 1844, and translated in the *Chemical Gazette*, vol. ii, p. 515, it is shown that the bilic acid and acid bilate of soda, may be procured in a crystalline state. In a subsequent communication by the same chemist, after correcting certain errors in his first paper, he proceeds to show that two distinct substances are met with in perfectly fresh bile:—"I have been able," he observes, "to cause bile, which was evaporated in a water-bath, and freed from mucus and the greater part of its salts by repeated solution in alcohol, to crystallize immediately. For this purpose nothing further is necessary than to add ether repeatedly to as strong an alcoholic solution of the bile as possible, and then to set it aside in a cool place. The principal and most important constituent of the bile then crystallizes, in the same manner as in my former experiments; but $\frac{1}{8}$—$\frac{1}{4}$ of the bile used does not crystallize, but remains as a yellowish-brown syrupy liquid. I have not been able to succeed in separating this in any manner from the crystals; consequently, I can say nothing more concerning its nature. It is, however, evidently a different substance from the principal constituent of the bile, perhaps even a product of its decomposition. The decomposition of the bile begins even in the organism, and it is impossible to examine fresh bile which is not partly decomposed. The brown liquid appears to consist principally of biliary colouring matter. I must, however, remark that the crystals have also a slightly yellow tint. By this new observation my former communications are confirmed. The principal constituent of bile is a compound of soda with a peculiar organic body, and this compound may be immediately procured from the bile without its undergoing any important alteration. Liebig called this compound *bilate* of soda; I have denominated it choline-soda. It does not appear to me sufficiently proved, that the principal organic constituent of bile is positively an acid. It is possible that, like albumen, it may combine with acids as well as with bases. The most recent examinations of the bile by Berzelius would then be partly true. Further experiments must decide this. These, however, are peculiarly difficult, because, in separating the bile from soda, an acid body may undoubtedly be formed. From the above observation, it is further evident that the formula advanced by Liebig for bilic acid must be incorrect; for Kemp, Theyer, and Schlosser have not analysed the essential biliary ingredient in a perfectly pure state, but have always at the same time included the brown syrupy fluid. Finally, it is evident from these communications, that in precipitating bile by metallic salts, different precipitates must always form, as Gmelin supposes, and that Liebig is in error when he opposes this view. I thus conclude, believing that the disputations concerning the bile may be considered as settled, at least on the main point."

We have already had occasion to mention *taurin* as one of the products of decomposition of the bile when digested with hydrochloric acid. The formula that has been generally accepted as representing its composition, is $C_4 H_7 NO_{10}$, but Redtenbacher has recently stated that it contains 25% of sulphur.

Lehmann had previously asserted that he had always found sulphur in bilin, but did not attempt a quantitative analysis.

40. *Morbid Bile.* The bile of a man who died in a state of icterus, was examined by Scherer. It was of a blackish-green colour, formed a thick

fluid, and exhibited under the microscope a large number of black pigment cells. It contained, in 1000 parts—

Water	859·6	Fat	8·6
Solid constituents	140·4	Bile-pigment	44·3
Bilin	48·6	Salts	8·0
Bilifellinic acid	30·5		

Not a trace of cholesterin could be discovered in the fat. Scherer seems to regard its absence as singular; but Berzelius, although he places it amongst the biliary constituents, states that it amounts to only ·0001% in healthy bile,—a quantity easily overlooked. The bile-pigment imponderable in healthy bile; its amount, as well as that of the solid constituents generally, is enormous.

41. *On the Composition and Properties of Biliary Colouring Matter.* Scherer* has made some analyses of the colouring matter of the bile collected from the urine of a patient suffering from jaundice. The fresh urine, after filtration, was treated with chloride of barium. The green precipitate was washed with water, thrown on a filter, and the colouring matter separated from it by two separate methods.

(1.) The precipitate was boiled in water with carbonate of soda, and the resulting yellow solution filtered and decomposed by muriatic acid. The colouring matter which is almost insoluble in the acid liquid, was then placed on a filter, and dissolved in a mixture of two parts of alcohol and one of ether, in order to separate it from any uric acid that might have been thrown down with it and the beautiful dark green solution evaporated. The colouring matter adhered to the sides of the porcelain capsule, in the form of a dark green mass which by slow evaporation was completely dried and then easily pulverized. This powder was washed with distilled water as long as any muriatic acid could be detected by nitrate of silver.

(2.) Another and simpler method is this:—The baryta precipitate was at once decomposed by digestion with alcohol and muriatic acid at a gentle heat; the alcoholic solution was evaporated, washed on a filter with water, then dissolved in a mixture of alcohol and ether, and again evaporated.

The colouring matter obtained by either process, and washed with distilled water to remove the muriatic acid, forms a very beautiful dark green powder, almost insoluble in water, readily soluble in alcohol and spirit, but with some difficulty in pure ether. If a little caustic or carbonated alkali be added to the water it is dissolved in large quantity and the fluid acquires a colour varying from green to brown; it is also more soluble in water containing alkaline salts than in distilled water. When digested for some time with muriatic acid, the green colour is gradually converted into a blackish brown; this also occurs when it is gently heated for some time with alkalies. In both cases it is rendered less soluble in alcohol, becomes somewhat more soluble in water, and at the same time also loses the property of yielding the characteristic alterations of colour with nitric acid.

* Annalen der Chem. und Pharm. March 1845, and Chemical Gazette, No. 62.

On combustion with chromate of lead the colouring matter yielded—

	By the first process.		By the second process.
	1	2	
Carbon .	67·409	67·761	68·182
Hydrogen .	7·692	7·598	7·437
Nitrogen .	6·704	6·704	7·074
Oxygen .	18·195	17·937	17·261

In order to ascertain what alterations this colouring matter underwent by the slow action of the air, acids, and alkalies, one portion was treated with excess of muriatic acid, and the other with an excess of carbonate of soda and a little caustic potash, and kept for 14 days in shallow open vessels at a temperature of about 90°, whereupon it underwent the change of colour already mentioned. It was then reobtained from the first process.

100 parts contained	Digested with acid.	Digested with alkali.
Carbon . .	61·837	62·086
Hydrogen . .	6·464	6·567
Nitrogen . .	9·080	7·101
Oxygen . . .	22·619	24·246

Hence it appears that the biliary colouring matter loses a considerable amount of carbonic acid and hydrogen. Scherer shows by other analyses that the colouring matter in black, easily-powdered gall-stones which contain but little cholesterin approaches closely in composition to that which is formed by treating the ordinary colouring matter with acids or alkalies, and exposing it to the air. Moreover, in addition to this pigment, which forms the greater part of the smaller biliary calculi, they contain another, probably richer in carbon and hydrogen, and more closely resembling the normal colouring matter.

42. *On a new Test for Bile and Sugar.* By Dr. Pettenkofer. "The author remarked that when ox-gall had been treated with sugar, and concentrated sulphuric acid was added until the precipitated choleic acid had begun to redissolve, the mixture became considerably heated, and the liquor assumed a deep violet tint, similar to that of hypermanganate of potash. It was at first considered that this remarkable alteration might depend upon the decomposition of the biliary colouring matter; but it was found equally to occur, nay even more evidently, with the bile which had been decolorized, and with pure bilin obtained by Berzelius's method. All the attempts to separate the new product in an isolated state have hitherto completely failed. The author consequently confines his observations to the application of this phenomenon as a test (*a*) for bile (choleic acid), and (*b*) for sugar. The following is the method of proceeding:—A small quantity of the liquid supposed to contain the bile (if the substance be solid it must be treated with alcohol, and the solution evaporated), is poured into a test-tube, and two thirds of the volume of sulphuric acid added by drops. The heat of the mixture must be kept below 144° Fahr., otherwise the choleic acid will be decomposed. From 2 to 5 drops of a solution of 1 part of cane-sugar to 4-5 of water are now added, and the mixture shaken. If choleic acid be present, the violet-red colour will appear more or less distinctly according to the quantity present. The following precautions are

however requisite to be attended to:—1st. The temperature must not exceed that mentioned to any extent, otherwise the colour, although formed, will be again destroyed. 2d. The quantity of sugar must not be too large, because the colour of the sulphuric solution will become dark brown, and sulphurous acid will be formed, whereby the violet-red colour may be concealed or destroyed. 3d. The sulphuric acid must be free from sulphurous acid. 4th. If the fluid contain albumen, it is best to coagulate this previously, since albuminous solutions, although only when very concentrated and when heated with sugar and sulphuric acid, produce a similar colour. It could not be produced with mucous, nor with dilute albuminous solutions, which were always altered to a brown colour. 5th. A great excess of chlorides, although such is rarely found in animal bodies, converted the colour to a brownish red. 6th. If the bile be in very small quantity, the fluid should be carefully concentrated on the water-bath, extracted with alcohol, this also evaporated to a small volume, and the test applied to the cold solution. Sometimes an interval of several minutes is required for the production of the colour, especially when the sulphuric acid is added very slowly, and consequently a lower temperature is generated. In liquids, where the bile is in very small quantiy, as in urine and other secretions, the author has found it requisite to make a spirituous extract, to evaporate this nearly to dryness on the water-bath, and then to transfer the moist residue into a watch-glass. When quite cold, sulphuric acid and a very small quantity of syrup are added, so that the temperature of the solution remains low. In the course of a few minutes, if the most minute trace of bile is present, the colour is produced. In this reaction, grape-sugar, starch, or in fact any substance which is convertible into grape-sugar by sulphuric acid, may be substituted for cane-sugar. The same result was obtained with the bile of man, the fox, dog, ox, pig, fowl, frog and carp. The author concludes from this, that the bile of all the Vertebrata agrees chemically in containing choleic acid combined with soda.

By means of this test the author detected bile in the urine of a patient afflicted with pneumonia. The fæces of a healthy man, when extracted with spirit and treated as above, did not yield the slightest reaction, whilst on adding a little bile previously to the fæces it was perfectly developed. In the stools produced by calomel, several observers have remarked that the green or yellowish-green colour is converted into red by treating them with mineral acids; by applying the sugar and acid, the same phenomena are produced. In all cases of diarrhœa, bile is found in the stools. The author imagines that the alterative effects of purgatives might be thus explained, by their carrying off the bile as fast as it is secreted, consequently preventing its absorption.

Concentrated muriatic acid heated with bile and sugar, likewise produces a red colour, but this is much lighter and less beautiful than with sulphuric acid.

This test may also be adopted for the detection of sugar. If sugar be suspected in a liquid, urine for instance, an aqueous solution of ordinary ox-gall is gradually treated with sulphuric acid, until the precipitated choleic acid is again re-dissolved; the suspected urine is then added, whereupon the violet-red colour is produced. As the quantity of sugar present is usually small, it is best previously to concentrate it. To detect bile in blood, the albumen is first separated by ebullition

with spirit, and the concentrated fluid treated as above. If this test is used for sugar, the absence of starch must be previously proved by iodine.

The author thinks his test better than Trommer's in the examination of blood and urine, both because it acts more rapidly and delicately, and because its action is uninterrupted by the ammoniacal salts of the urine, the free ammonia of which retains the proto- and per-oxides of copper in solution until it is completely expelled by boiling, whereby the reduction of the oxide of copper may be readily effected by other substances. Pure manna and gall, when treated as above described, afford no trace of the peculiar reaction. It is thus easy to detect grape-sugar in manna.*

43. *On the Functions of the Bile.* That the bile is not merely an excrementitious fluid, intended to remove the effete matters from the blood, but that it is a secretion essential to the animal economy, was rendered almost certain by the experiments of Berzelius, Theyer, and Schlosser, which showed that the human fæces contained much too small a quantity of a substance resembling bile to justify the idea that it is evacuated in this matter. Schwann has recently established this opinion beyond a doubt, by a series of well-devised experiments on dogs. He tied the ductus choledochus, and at the same time formed a fistulous opening in the gall-bladder, by which the bile escaped externally. His most important conclusions are, 1st, That when the bile does not get into the bowel, its absence is generally perceptible in dogs, about the third day, by a marked diminution in weight; and, 2dly, That unless the channel for the conveyance of bile to the duodenum is re-established, symptoms of deficient nutrition, wasting, debility, &c., ensue, and death is the ultimate consequence.

A paper, containing some very ingenious speculations on this subject, was read before the British Association at their last meeting at York, by Dr. Kemp, a chemist well known for his ultimate analysis of the bile. Dr. Kemp commences by a reference to the fact that the food both of graminivorous and carnivorous animals consists essentially of two portions, the one adapted to the formation of nitrogenized, the other for the formation of the non-nitrogenized portions of the animal frame. Albumen and starch may be taken as types of these two classes. The chyle must represent the sum of the albumen and starch, (regarded as types), after having undergone certain changes necessary for assimilation, and these changes in the case of the albumen are known to be very trifling. If, therefore, the formula for albumen or protein (for in a certain sense they may be regarded as identical,) be deducted from the formula for chyle, the difference will represent the body into which the food typified by starch has been changed by digestion. Now $C_{58}\ H_{43}\ N_5\ O_{21}$ (chyle)—$C_{40}\ H_{31}\ N_5\ O_{12}$ (protein)=$C_{18}\ H_{12}\ O_9$, while the formula for starch is $C_{12}\ H_{10}\ O_{10}$. Dr. Kemp explains this difference (which has evidently taken place during digestion) in the following manner. He shows that, by the mere action of oxygen on the elements of the bile and starch, the result is a body represented by the formula $C_{18}\ H_{12}\ O_9$, which is the non-nitrogenous portion of the chyle. The organic portion of ox-bile may be represented by the formula $C_{48}\ H_{42}\ NO_{13}$,† and by the action of nitric acid on this body, we

* Ann. der Chem. und Pharm., Oct. 1844, and Chemical Gazette.

† This is the formula deduced by Kemp from his own analyses.

deprive it of the elements of ammonia, and obtain $C_{48}\ H_{39}\ O_{15}$, which may be put in the form $4\ (C_{12}\ H_8\ O_2) + 7\ H\ O$. But $C_{12}\ H_8\ O$ + 2 eq. starch $= C_{12}\ H_8\ O_2 + C_{24}\ H_{20}\ O_{20} = 2\ (C_{18}\ H_{12}\ O_9) + 2\ H\ O$. The coincidence in the formulæ is very singular; the view must, however, be regarded as merely hypothetical at present.

44. *The Gastric Fluid, its Nature and Properties.* M. Blondlot has recently published in Paris, a Treatise on Digestion, detailing very numerous experiments made upon a dog, in which a fistulous opening into the stomach was maintained for upwards of two years. The gastric juice was obtained in very large quantities. Submitted to distillation, the fluid passing over did not exhibit the slightest acid re-action, whilst the residue in the retort was always strongly acid. It is therefore certain that the acid of the gastric fluid is neither hydrochloric nor acetic acid, since both these are volatile. The gastric fluid of other animals gave the same result on being distilled. When chalk or any other carbonate of lime is added, no effervescence ensues, which further proves the acid not to be the lactic. M. Blondlot concludes that the acid reaction of healthy gastric juice is owing to the presence of superphosphate and biphosphate of lime. He adds—1st. That there is no other acid which can remain acid, and fail to decompose carbonate of lime. 2d. That sulphuric acid, added to gastric juice, precipitates an abundance of sulphate of lime, and oxalic acid precipitates oxalate of lime. 3d. Potass, soda, ammonia, and lime water, produce abundant precipitates of neutral phosphate of lime. 4th. That calcined ash of gastric juice is not deliquescent, dissolves without effervescence in hydrochloric acid, forming chloride of calcium; it therefore contains neutral phosphate of lime, the excess of acid being drawn off in the calcination.

M. Blondlot also made many experiments to determine whether, during digestion in the healthy stomach, lactic acid is formed by the transformation of sugar, starch, or other substance, and his conslusion is, that it is never found. He could never find even a trace of it, although he analysed the fluid expressed from the contents of the stomach, after remaining in the stomach various periods. He conceives that the acid of the gastric juice prevents the lactic acid fermentation, just as other acids are known to do under other circumstances. In confirmation of this, M. Blondlot relates many experiments upon birds and ruminating animals, which show that the formation of lactic acid in these creatures takes place only in those parts of the alimentary canals where no acid is present—namely, in the crop of birds, the first and second stomach of ruminants, and the cæcum of man, and other animals. He first proves that the acid found in these cavities is not secreted by their walls. Feeding sheep, goats, chickens, and pigeons, on food destitute of sugar, and examining the fluid found in the cavities mentioned, he found it invariably alkaline. On the other hand, the addition of sugar to the food produced an acid fluid in the same cavities which proved to be the lactic. The contents of the cæcum are not more acid than those of the small intestines, except sugar has been taken in the food; but when sugar has been taken, it undergoes the lactic fermentation in the cæcum. These experiments agree with those of Mr. Ross, published in the *Lancet* for January 20 and February 10, 1844. Tiedemann and Gmelin found an acid in the crop of a pigeon, which had fed for several days on nothing but meat; but this, as M. Blondlot shows,

probably had regurgitated from the stomach—an incident requiring precautions to prevent, after death.

M Blondlot believes that the digestive property of gastric juice depends, not on its obvious chemical constitution, but upon a peculiar organic principle. If exposed to a temperature of 104° to 122° F., or higher, it loses entirely and irrevocably its digestive powers, although to all appearance, and even as to its composition, as made known by analysis, it remains unchanged. With the exclusion of the air, gastric juice may be kept for two years without loss of its activity; but with the free access of air, it putrefies in five or six days, although the chyme which it forms from nitrogenous organic substances may be preserved for two or three months without change. The precipitation of all the lime it contains does not affect its activity, nor are its chlorides indispensable, but whatever acts upon its organic constituents, heat, strong alcohol, or strong acids, or which removes them, such as animal charcoal, chlorine, tannic acid, or acetate of lead, destroys all its digestive properties.

M. Blondlot also shows—*a*. That coagulated albumen resists the action of the gastric juice only from its compact form. When coagulated in very small particles, as white of an egg beaten into a froth and poured into boiling water, it is digested as quickly as soft fibrine. *b*. That the action of the stomach in coagulating milk is not due to its digestive principle solely, but to its acid, which acts like lactic acid. *c*. The effect of the gastric fluid upon bones, whether entire or not, is to disintegrate the matter slowly, beginning at the surface, and to reduce the earthy matter into a fine chalky powder, but without dissolving or decomposing it. The earthy matter not being dissolved, proves that no hydrochloric acid has acted upon it; it is all discharged with the fæces.

The physiological results of M. Blondlot's experiments confirm those of M. Beaumont, which are already familiar to our readers.

Since the work of M. Blondlot was published, two other French chemists, MM. C. Bernard and C. Barriswil, have made an experimental investigation into the properties of the gastric juice. They start with the assumption that this fluid owes its digestive properties to the union of two principles: 1st, an acid; 2d, a peculiar organic matter destructible by heat. What is the nature of the acid? "The principle fact which has been adduced to prove that the acid reaction is owing to the presence of biphosphate of lime is, that it may be treated with carbonate of lime without effervescence. Our experiments show that this arises from the dilution of the acid, which allows the carbonic acid to be dissolved as it is formed. When, therefore, the gastric juice is concentrated, it causes a considerable effervescence with chalk. Moreover, gastric juice dissolves neutral phosphate of lime, whilst this salt is entirely insoluble in solution of the biphosphate." On distilling gastric juice, the first distillate exhibits no acid reaction. If a mere trace of acetic acid or acetate of soda is added, and afterwards distilled, it gives an acid reaction; the normal acid is not therefore acetic. This also appeared, at first sight, to prove it could not be hydrochloric acid; but on distilling water rendered slightly acid by hydrochloric acid, nothing passes over at first but pure water, the acid not distilling until the end of the operation. On distilling gastric juice a neutral limpid liquor

passes over, which does not precipitate with nitrate of silver; but when about four fifths has distilled over, the distillate is perceptibly acid, yet, nevertheless, it does not render a solution of nitrate of silver turbid; but at the end, and when only a few drops of the gastric juice remain in the retort, an acid liquid passes over which precipitates salts of silver; this is, doubtless, hydrochloric acid. Does this acid exist free in gastric juice, or has a chloride been decomposed in this operation? When the least trace of oxalic acid is added to gastric juice which we know contains lime, a turbidity is produced from the formation of an insoluble oxalate of lime; but if to water acidified with 2000ths of its amount of hydrochloric acid, and containing chloride of lime, the same re-agent be added, no turbidity ensues. This clearly proves that hydrochloric acid exists as a chloride in the gastric juice, and not in a free state.

When concentrated by evaporation, gastric juice is strongly acid, effervescing with chalk, and not losing its acid reaction in the presence of an excess of the chalk. This proves the presence of *phosphoric acid.* On saturating the acid with lime and oxide of zinc, and filtering the solution, the neutral filtrate contains both zinc and lime, therefore the phosphoric acid is not the only free acid in the juice. What is the acid combined with the zinc and lime in the filtered solution? It is one which, as we have seen, passes over at the end of the distillation, and does not precipitate salts of silver. These characters belong to lactic acid. On distilling water slightly acidulated with lactic acid, and a small quantity of chloride of sodium added, it presents a complete analogy to gastric juice; first, pure water passes over, then an acid which does not precipitate salts of silver, and the last drops carry over hydrochloric acid. So that it is evident that the presence of hydrochloric acid in the last product of distillation of the gastric juice is owing to the decomposition of the chlorides by lactic acid.

Hydrochloric acid cannot exist in a free state in presence of a lactate, a phosphate, or an acetate. "We have observed," say the authors, "in the acid of the gastric juice all the characters of lactic acid, as pointed out by M. Pelouze; both give soluble salts of lime, barytes, zinc, and copper, a double salt of copper and lime, deeper in colour than the simple salt, a salt of lime soluble in alcohol, precipitated by ether." From the above facts, MM. Bernard and Barreswil conclude that the acid reaction of the gastric juice is not owing to biphosphate of lime, but arises from a free acid, which is not hydrochloric acid or acetic acid. They have always found lactic acid, with a minute proportion of phosphoric acid, the latter being a product of the reaction of the lactic acid on the phosphates present. According to their opinion, lactic acid is a constant production of the stomach. They do not mean to say that the digestive powers of the gastric juice are owing to lactic acid; on the contrary, they think if an acid reaction be indispensable other acids may supply its place, because among the various salts constantly introduced into the stomach with the food, some will have their acid replaced by the free lactic of the stomach, and the new acid liberated may supply the place of the normal acid.

M. Melsens * has also examined the gastric juice, and denies the accuracy of Blondlot's experiments.

* Journal de Pharmacie, Jan. 1845.

45. *Transformations of the Sugar in Food.* M. Chossat* found that of many birds fed on sugar alone, none lived more than sixteen days; and he thought he observed that in those which had copious bilious evacuations, no unusual quantity of fat was accumulated in the body; but in those in which these discharges did not occur, fat was abundantly formed. He assumed, therefore, that the sugar is, under varying circumstances, sometimes converted into the constituents of fat, and sometimes into those of bile. But the experiments of M. Letellier,† which were more carefully made, contradict these. Their results were, that among seven turtle-doves fed on cane-sugar and bread with water (coagulated albumen having been added, in two cases, after the sixth day,) not one possessed, at the time of death, the average quantity of fat; their general average of fat was nearly 60 per cent. less than that found in healthy individuals, i.e. the average in health was found to be 15·8 per cent. and in those fed on sugar only 6·3. Yet the fæcal evacuations had been in most cases moderate. But the sugar, though it did not increase the fat, served towards maintaining the temperature of the body, and the average production of carbonic acid. The quantity produced by these birds, on ordinary diet, was 13·2 grains per hour; during seven days' starvation, it was 6·65 grains per hour, and during three days' diet of sugar 11·08 grains. In turtle-doves fed for six days on butter, the quantity of fat found after death was scarcely more than in those who had died on the diet of sugar without albumen; and the quantity of carbonic acid produced by them was 9·08 grains per hour. And to these evidences of the transformation of saccharine into fatty substances, it may be added that butyric acid may be formed in the fermentation of sugar,‡ and that M. Avequin‖ has noticed, that the quantity of that crystalline wax which forms on the exterior of the sugar-cane (and which he has named cerosia), always bears an inverse proportion to the quantity of sugar within the cane.

MM. Bouchardat and Sandras fed some dogs for several days on sugar. After their death, sugar more or less modified was detected in every portion of the intestinal canal. In one part, it was found as ordinary sugar, in another, as "sucre interverti," and in another as lactic acid. The urine, blood, chyle, and bile of these dogs contained traces of "sucre interverti" and of lactic acid. In order that the sugar should thoroughly disappear in the blood, they conceive that it must be first changed into sugar of grapes and lactic acid in the intestinal canal; the ultimate products of the decomposition being water and carbonic acid.§

46. Enderlin¶ has carefully examined the contents of the various portions of the intestinal tube of the hare.

* Gazette Médicale, 21 Oct. 1843, from the Académie des Sciences, séance du 16 Oct.

† Annales de Chimie et de Physique, Juin, and Annales des Sciences Naturelles, Juillet 1844.

‡ Annalen der Chimie und Pharmacie, Oct. 1843.

‖ In Mulder's Physiol. Sheikunde, p. 271; and Mr. Paget's Report on the Progress of Physiology.

§ Journal de Pharmacie et de Chimie, March 1845.

¶ Liebig's Annalen, 1844.

A. *Contents of Stomach.*

A green, firm, *very acid*, mass, yielding on incineration a copious *faintly alkaline* ash, containing no carbonates, and a very small amount of soluble salts.

100 parts of the ash contained,
93·50 insol. (3 CaO, PO_5, and CaO, SO_3), and
6·50 sol. salts (3 NaO, PO_5, and Cl. Na.)

The amount of PO_5 in the soluble salts = 0·833%.

B. *Contents of Duodenum.*

A creamy, caseous, yellow, *alkaline* mass, yielding on incineration a small, white, fused, effervescing, and *very alkaline* ash, containing a large amount of soluble salts, including carbonates.

100 parts of the ash contained,
14·63 insol. (3 CaO, PO_5,, and CaO, SO_3), and
85·37 sol. salts (3 NaO, PO_3, & NaO, CO_2 abundant, NaO, SO_3, and Cl. Na.)
The amount of PO_5 in the soluble salts = 30·490%.

C. *Contents of Small Intestine.*

A yellowish green, semifluid alkaline mass, yielding on incineration a small, white, very alkaline ash, containing a large proportion of soluble salts, but no carbonates.

100 parts of the ash contained,
9·412 insol. (3 CaO, PO_5, and CaO, SO_3),
90·558 sol. salts (3 NaO, PO_5, NaO, SO_3, Cl. Na.)

The amount of PO_5 in the sol. salts = 19·780%.

D. *Contents of Cæcum.*

A dark green, consistent, *very alkaline* mass, with a fecal odour, yielding on incineration a copious, white ash, containing a small proportion of soluble salts, and no carbonates.

100 parts of the ash contained,
73·90 insol. (3 CaO, PO_5, and CaO, SO_3), and
26·10 sol. salts (3 NaO, PO_5, NaO, SO_3, & Cl. Na.)
The amount of PO_5 in the soluble salts = 2·884%.

E. *Contents of Colon.*

A dark green *alkaline mass*, yielding on incineration a copious gray ash, containing a very small proportion of soluble salts, and no carbonates.

100 parts of the ash contained,
94·15 insol. 3 CaO, PO_5, and CaO, SO_3),
5·85 sol. salts (3 NaO, PO_5, NaO, SO_3 and Cl. Na.)
The amount of PO_5 in the soluble salts = 0·380%.

The salts of the Blood and Liver were likewise examined.

100 parts of the ash of the blood contained,
15·536 insoluble,
84·454 soluble salts.
The amount of PO_5 in the soluble salts = 5·930%.

100 parts of the ash of the liver contained,
14·706 insoluble,
85·294 soluble salts.
The amount of PO_5 in the soluble salts = 24·333%.

It is worthy of remark that the ash yielded by the contents of the duodenum *alone* effervesces, and consequently contains an alkaline carbonate. Enderlin asks if this may not be regarded as a proof of the correctness of Liebig's opinion that the choleate of soda, (which yields the carbonate on incineration), is perfectly absorbed.

47. *Milk.* Haidlen* has recently proposed a new method for analysing milk. It consists in coagulating the milk by gypsum, by which means the error in the determination of the casein that resulted from all former methods, is avoided.

When milk is stirred with about one fourth of its weight of finely-pulverized gypsum, and heated to 212°, it is entirely coagulated; and when the whole is then evaporated to dryness, a brittle mass is obtained, which is easily reducible to powder. From this powder the butter may be extracted by ether; the sugar of milk and soluble salts may be removed by hot alcohol of 0·85; while the caseate and sulphate of lime, and insoluble salts, remain undissolved. The alcoholic solution scarcely exhibits any perceptible opacity on the addition of chloride of barium, showing that no error in the result is occasioned by any of the gypsum being taken up by the alcohol.

About 100 grains of gypsum and four times its weight of milk, answer very well. The soluble salts extracted from the milk by the alcohol may easily be determined by incineration; and since their amount is to that of the insoluble salts in the average proportion of 5 to 7, the amount of the latter may at least be found approximately, and the ascertained weight of the sugar and casein corrected accordingly. But if it is desired to determine the salts with perfect accuracy, it is best to incinerate a weighed quantity of milk, and to analyse the residue. By the above process he obtained the following results, in 100 parts:—

	Milk of Cow.	Milk of Woman.	Milk of a Sickly Woman.
Butter	3	1·3	3·4
Sugar of milk	4·6	3·2	4·3
Casein and insoluble salts	5·1	2·7	3·1

Two analyses of the ashes obtained from the milk of two different cows gave, for 100 parts of milk—

	1st.	2d.
Phosphate of lime	·231	·344
Phosphate of magnesia	·042	·064
Phosphate of peroxide of iron	·007	·007
Chloride of potassium	·144	·183
Chloride of sodium	·024	·034
Soda	·042	·045
	·490	·677

Dr. Schlossberger has published an analysis of milk obtained from a male goat. After noticing the previously recorded cases of milk being yielded by the mammary gland of the male, he describes the case that fell under his own observation in the following terms:—

"Last summer, a buck, furnishing milk, was found in the Neuhof estate, near Giessen, and by the kind invitation of Professor Liebig, the author having had a desirable opportunity afforded to him of making an accurate investigation, was enabled to decide upon the subject in question.

* Simon's Beitrage, p. 358, and Rapport Annual, &c. p. 393.

"The above-mentioned buck was four years of age, and so late as last autumn, he gave satisfactory proofs of his male sex; the testes and penis were examined by Dr. Bardeleben and myself, and found to be of the normal size and development; it was the same with regard to the horns. The two dugs occupied the place in which they usually are met with in bucks, and were of the size of a fist. With some force, which, as it appears to me, occasioned some painful sensation, a liquid resembling milk could be expressed, the quantity of which seemed to be rather inconsiderable; but the animal frequently most eagerly sucking its dugs, it was difficult to obtain considerable quantities of the secreted liquid. I am, however, indebted to the kindness of the proprietor, Mr. Firnhaber, for several ounces of it.

"The fresh liquid, obtained by repeated milking, was, throughout, of the colour, consistence, and taste of good milk; and, what is the more remarkable, notwithstanding the vicinity of the fetid organs, no unpleasant odour or taste was noticed. Under the microscope numerous butter globules appeared, the great majority of which were isolated, and singly moved freely one over another; but after this secretion was observed for at least four weeks, rather solid agglomerations of globules were found therein (apparently quite of the same nature as the isolated ones), a species of *corps granuleux* (granular body) discovered by Donné in the *colostrum;* by ether these likewise disappeared. In addition to this, some cells of epithelia were mixed with it (perhaps accidentally). The reaction of the milk was scarcely alkaline; on standing for some time, it deposited a considerable quantity of cream; it showed, however, no great inclination for becoming acid.

6·771 grammes of milk, on being incinerated, left 0·053 grammes of almost pure white ashes; hence 0·782 per cent. In 100 parts of these ashes were 41·6 insoluble in water, and 58·4 salts soluble in water, such as are usually met with in milk. To determine the other constituents of the milk quantitatively, the method recommended by Haidlen was adopted. 17·800 of milk, on being heated with 3·204 gypsum, and dried at 212° F., left 5·858 of solid residue, in which, therefore, 2·654 of *solid parts of milk* corresponded to 14·91 per cent. 5·514 grammes solid residue (containing gypsum,) on being extracted by ether, left 5·136; hence 2·12 parts of the solid constituents of milk (the gypsum being subtracted) yielded 0·378 butter. From the residue (5·136) exhausted by ether, alcohol extracted *sugar of milk* and *salts*, and it weighed after this extraction 4·766; hence we calculate 0·370 sugar of milk and salts soluble in alcohol, for 2·12 solid constituent parts of milk. That which remained, still combined with the gypsum, consisted of casein and salts soluble in alcohol, amounting to 1·376 for 2·12 solid constituent parts of milk.

" 100 parts of buck's milk, therefore, contain—
" 85·09 water.
" 14·91 solid constituent parts (containing 0·782 fixed salts).
" In 100 parts of the solid constituent parts are:—
" 17·83 butter.
" 17·45 sugar of milk and salts soluble in alcohol.
" 64·71 casein and salts insoluble in alcohol.
" In 100 parts of the buck's milk are consequently—
" 85·09 water.
" 9·66 casein (with salts).

" 2·60 sugar of milk (with salts).
" 2·65 butter.

" The alcoholic extract of the milk was then investigated solely with reference to its contents in sugar of milk, its presence was clearly proved by sulphate of copper and potassa, and in various other ways.

" On comparing the results obtained here with the analyses of milk known hitherto, it appears that buck's milk is remarkable for its *richness in casein;* whereas it is proportionately poorer in butter and sugar of milk than, for instance, cow's milk: it manifestly approaches nearest to the milk of goats, the analyses of which were made some time back, and when the methods adopted were probably rather imperfect.

" Goat's milk contains, namely, in 100 parts *—

	According to Boysson.	Luiscius.	John.
Casein	5·29	9·12	10·54
Butter	2·99	4·56	1·17
Sugar of milk	2·07	4·37	2·34
Water	89·28	81·93	84·93

" The case of formation of milk in an animal belonging decidedly to the male sex is, perhaps, likewise of some importance for the theory of secretion; it seems to prove the independence of the formation of milk of a peculiar (puerperalis) syncrasy of the blood proper to the pregnant or newly-delivered female animal, confirming the view that the *development of an organ of secretion* is of an unequally higher importance to the production of a specific secretion than a certain syncrasy of the blood. The elements producing milk are present in the blood of both male and female: on the existence of the glands depends the transformation into milk. Or must we suppose that even in male animals furnishing milk a puerperal syncrasy of the blood takes place, a property of the blood of which the medical man, rather than the chemist, might form a clear conception."

48. *Mucus and Pus.* Nasse has published the following analysis of fresh pulmonary mucus:—

	1.	2. Dried residue.
Water	955·520	
Solid residue	44·480	
Mucin with a little albumen	23·754	53·405
Water-extract	8·006	18·000
Alcohol-extract	1·810	4·070
Fat	2·887	2·490
Chloride of sodium	5 825	13·095
Sulphate of soda	0·400	0·880
Carbonate of soda	0·198	0·465
Phosphate of soda	0·080	0·180
Phosphate of potash with traces of iron	0·974	2·190
Carbonate of potash	0·291	0·655
Silica and sulphate of potash	0·255	0·570

In the determination of his salts Nasse seems to have overlooked the circumstance that sulphate of soda cannot occur in fluids containing either carbonate or phosphate of potash.

* Vide Burdach's Physiology, vol. iii. p. 148.

Several analyses of pus have been made by Dr. Wright.* The three following analyses will serve as specimens.

	Pus from a vomica.	Pus from a psoas abscess.	Pus from a mammary abscess.
Water	894·4	885·2	879·4
Fatty matter	17·5	28·8	26·5
Cholesterin	5·4		
Mucus	11·2	6·1	
Albumen	68·5	63·7	83·6
Lactates, carbonates, sulphates, and phosphates of soda, potash, and lime	9·7	13·5	8·9
Iron	a trace		
Loss	3·3	2·7	1·6

Nasse† has published two analyses, one of serum of pus and the other of serum of blood, with the view of comparison.

The following are his results:—

	Serum of pus.	Serum of blood.
Water	890·00	906·5
Solid residue	110·00	93·5
Organic constituents	92·58	85·7
Chloride of sodium	12·60	4·6
Carbonate of soda	2·22	1·4
Phosphate of soda	0·32	0·9
Sulphate of soda	0·18	0·2
Phosphate of lime	1·20	0·7
Carbonate of lime	0·90	

The peculiar animal matter, *pyin*, that has been isolated, by some chemists, from pus, has been shown by Mulder to be merely trit-oxide of protein.

Pus sometimes contains infusoria: thus, R. Wagner has observed minute ciliated animalcules in pus from cancer of the lip. Valentin has likewise noticed them in the purulent fluid of carcinoma. Donné has observed the vibrio lineola in pus from chancres and gonorrhœa, and found other forms of infusoria in pus from syphilitic vaginitis; they were twice the size of the blood-corpuscles, with a round or elliptic body, considerably prolonged anteriorly: he proposes for this animalcule the name of *trichomonas vaginalis*.

§ VI.—*The Urine.*

49. *Urine in health.* The researches of Liebig on this subject, although of the highest importance, hardly fall within the scope of this report. It is necessary, however, to state this much regarding them. He has disproved the existence of lactic acid in the urine; but after repeating the steps of Lehmann's analyses (who has made numerous quantitative determinations of this acid in the urine during different diseases), allows that he obtained results apparently similar to those of Lehmann, except that what the latter chemist supposed to be lactate of zinc, was in reality not a lactate, but a zinc compound of a nitrogenous body. He proves

* Medical Times, Jan. 11, 1845. † Simon's Beiträge, p. 338.

that hippuric acid is associated with uric acid in human urine, and considers that their solvent is common phosphate of soda, because on the addition of these acids to a solution of that salt, there are formed a urate and hippurate of soda, and an acid phosphate of soda. He does not, however, regard the presence of these acids as the only cause of the acidity of the urine. The sulphur of the constituents of the blood becomes ultimately converted into sulphuric acid by the oxygen absorbed in the process of respiration, and appears in the urine in the form of sulphates. The alkaline base with which this sulphuric acid is combined is supplied by the soluble alkaline phosphates, which, in consequence of this partial deprivation of base, are converted into acid salts. Hence the acid, alkaline, or neutral reaction of the urine of healthy persons, does not depend on any difference in the processes of digestion, respiration, or secretion, but on the constitution of the aliments, and on the alkaline bases that enter the organism through the medium of these aliments.*

The nitrogenous substance resembling lactic acid has been subsequently examined by M. Pettenkofer. He exhibited it by precipitating the alcoholic extract obtained from carefully-evaporated urine, and which had been neutralized with a little carbonate of soda, with a concentrated alcoholic solution of chloride of zinc. He obtained first an amorphous precipitate, insoluble in water, and then minute granular crystals, soluble in a large quantity of water, and very similar to lactate of zinc. They form four-sided prisms with oblique terminal surface, and are insoluble in alcohol and ether. The adherent metallic chloride is removed from them by digestion in boiling alcohol. When they are dissolved in water and warmed with hydrate of barytes, the colouring matter is precipitated along with some oxide of zinc; the barytes and oxide of zinc are then removed as carbonates by passing carbonic acid through the solution; the filtered liquid is evaporated to dryness, redissolved in spirit, the barytes still present thrown down by sulphuric acid, the sulphuric and hydrochloric acids removed by boiling with oxide of lead, and any lead contained in the filtered solution got rid of by sulphuretted hydrogen. On evaporating the solution filtered from the sulphuret of lead, a white crystalline neutral substance is obtained, which dissolves easily in water and alcohol, has a slightly bitter pungent taste, and is not precipitated from its alcoholic solution by chloride of platinum. It is nitrogenous, and contains 39·37-39·28 per cent. C, 6·79-7·39 H, 33·63-34·41 N; the formula $C^8 N^3 H^8 O^3$ requires 39·2 C, 6·4 H, 34·7 N, and 19·7 O.†

A new acid in the human urine has likewise been announced by Heintz. It also resembles lactic acid in forming very sparingly soluble salts with oxide of lead: it differs however from lactic acid in several particulars, the two most important being that it separates in crystals and that it contains nitrogen. From 50 pounds of urine, Heintz was only able to extract about 8 grains.‡

50. *Composition of Healthy Urine.* The urine in its normal condition has been recently analysed by Becquerel, Lehmann, Simon, Marchard, and myself. It is singular that the analyses of Lehmann and Marchard

* Lancet, Nos. 11, 12, vol. I, 1844.

† Liebig's Annalen, liii. p. 97.

‡ Poggendorf's Annalen, vol. 62, p. 602.

approximate closely to the old analysis of Berzelius, while those of Becquerel, Simon, and myself agree pretty clearly with each other, but are far removed in their results from the former group. The following analyses will illustrate this point :—

	Marchard.*	
	1.	2.
Water	933·199	938·856
Solid constituents	66·801	61·144
Urea	32·675	30·321
Uric acid	1·065	1·001
Free lactic acid	1·521	1·362
Extractive matters	10·513	10·032
Vesical mucus	0·283	0·201
Sulphate of potash	3·587	3·201
Sulphate of soda	3·213	3·011
Phosphate of soda	3·056	2·998
Biphosphate of ammonia	1·552	1·231
Chloride of sodium	4·218	4·001
Chloride of ammonium	1·652	1·231
Earthy phosphates	1·210	1·001
Lactates	1·618	1·032

As an illustration of the other group, we will quote two of Simon's analyses :—

	Simon.	
	1.	2.
Water	963·00	956·000
Solid constituents	36·20	44·000
Urea	12·46	14·578
Uric acid	0·52	0·710
Alcohol-extract and lactic acid	5·10	4.800
Spirit-extract	2·60	5·593
Water-extract and mucus	1·00	2·550
Lactate of ammonia	1·03	
Chloride of ammonium	0·41	
Chloride of sodium	5·20	7·280
Sulphate of potash	3·00	3·508
Phosphate of soda	2·41	2·330
Earthy phosphates	0·58	0·654
Silica	a trace	a trace.

For other analyses of healthy urine, and for an account of Lehmann's experiments respecting the effect of diet on the urine, I must refer to the Lancet, Feb. 15th, 1845.

Segalas has instituted a series of experiments on dogs, with the view of ascertaining the effect of lesions of the spinal cord on the urinary secretion. His conclusions are that every portion of the spinal cord may be successively destroyed, without the secretion of urine being suspended, or even sensibly diminished, provided respiration be artificially kept up, and that any changes that may occur in the composition of the urine are not produced directly by the lesion, but result from the secondary catarrhal inflammation of the bladder.

51. *Urine in Disease.* In consequence of the length to which this report has already extended, I must refer the reader to the Lancet, Feb. 15th, 1845, where he will find two analyses of the urine in

* Lehrbuch der Physiologischen Chemie. 1844, p. 292.

pericarditis, two in pneumonia, one in hepatitis, one in puerperal peritonitis, four in Bright's disease, nineteen in typhus, one in land scurvy, four in chlorosis, one in cholera, one in rheumatism, four in rhachitis, one in phthisis, and ten in diabetes mellitus. The following are the principal additions to this department of pathological chemistry:—

52. *Urine in Herpes Zoster.* Heller* has analysed the urine in three cases of this disease:—

1. A boy aged 8 years; eruption on the right side; no fever; urinary secretion abundant. The urine was of a pale yellow colour, rather turbid, rapidly became putrid, and deposited a sediment of beautifully formed crystals of ammoniaco-magnesian phosphate.

The urine was faintly alkaline on emission, and its specific gravity varied from 1014 to 1015. It contained in 1000 parts:—

Water	970·00
Solid constituents	30·00
Urea	8·94
Uric acid	traces
Fat	0·14
A little extractive matter with a large amount of muriate and carbonate of ammonia	9·32
Fixed salts consisting of	11·60
Earthy phosphates	2·000
Chloride of sodium	4·154
Sulphate of potash	0·164
Phosphate and carbonate of soda, &c.	5·282

Not a trace of hippuric acid could be discovered.

2. A man aged 31 years: eruption on right side; slight fever. Urinary secretion considerably suppressed, the urine analysed being the first that had been passed for twenty-four hours. In a few hours it formed a sediment of ammoniaco-magnesian phosphate and urate of ammonia. It was strongly alkaline, and its specific gravity was 1028. It contained in 1000 parts:—

Water	944·40	
Solid constituents	55·60	
Urea	15·79	
Uric acid with a little urate of ammonia	1·80	
Fat	0·34	
Extractive matters, with much hydrochlorate and carbonate of ammonia	21·35	
Fixed salts in the sediment	0·43	16·75
Fixed salts in the urine	16·32	
consisting of		
Earthy phosphates	2·85	
Chloride of sodium	5·10	
Sulphate of potash	0·15	
Phosphate of soda, &c.	8·24	

3. A young man, aged 19 years: eruption chiefly on left side; no fever. The urine was very clear. In the course of 12 hours it became turbid and deposited beautiful crystals of ammoniaco-magnesian phosphate. Specific gravity 1018.

* Archiv, vol. i, pp. 39-43.

The urine contained in 1000 parts,

Water	958·90
Solid constituents	41·10
Urea	14·20
Uric acid	0·20
Fat	0·12
Extractive matters, much muriate of ammonia, &c.	12·14
Fixed salts	14·44
consisting of	
Earthy phosphates	2·60
Chloride of sodium	5·40
Sulphate of potash	0·08
Phosphate and carbonate of soda, &c.	6·36

From these analyses we may conclude that in Herpes Zoster the chief peculiarities of the urine are:—

1. A marked increase in the chlorides and phosphates, and a corresponding diminution in the sulphates.
2. An excess of hydrochlorate of ammonia.
3. A large amount of fat.
4. A diminution in the amount of uric acid. It is only increased when the disease is accompanied with fever.

The presence of oxalate of lime may always be suspected in these cases.

As it has been requisite to devote a much larger space than will be usually required to the chemistry of the blood, in consequence of the Memoir of MM. Becquerel and Rodier, we are compelled to postpone the notice of several important papers to our next report.

VI.

REPORT ON THE PROGRESS OF MATERIA MEDICA AND PHARMACY.

BY GEORGE JOHNSON, M.D. LOND.

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1. *The medicinal qualities of the Indian Hemp, and the best mode of administration.* The hemp has long been known in India as a powerful intoxicating plant. It has in consequence a variety of names applied to it in Arabic, some of which have been translated as "leaf of delusion," "increaser of pleasure," "exciter of desire," "cementer of friendship," &c. Linnæus was well acquainted with its "vis narcotica, phantastica, dementens."* In 1839 Dr. O'Shaughnessy † directed attention to it as a valuable remedy in rheumatism, tetanus, cholera, and infantile convulsions, and published some cases treated by himself, Mr. O'Brien, Dr. Bain, and Mr. Richard O'Shaughnessy, the result of which appears fully to justify the opinion he entertains of it, as a most valuable therapeutical agent. Thus one patient, in whom tetanus supervened upon cauterization of the back of the hand by a native empiric, was completely relieved of the tetanic paroxysms, but died from the extension and mortification of the ulcer on the hand. Of seven cases of severe tetanus treated by Mr. O'Brien, four recovered; and one deplorable case of traumatic tetanus, arising from two suppurating wounds on the scrotum, was cured by Mr. Richard O'Shaughnessy. The effects of the hemp in these cases were giddiness, intoxication, and sleep, during which the tetanic paroxysms ceased, returning again with diminished violence on awaking, and being again removed by a repetition of the medicine. Since the publication of Dr. O'Shaughnessy's essay, the hemp has been administered in this country, both to animals and to the human subject, but without any very marked effects.‡ Mr. Donovan has ascertained that hemp grown in this country is destitute of the principle which renders the Indian plant so desirable an excitant to the voluptuous people of the east. As to the mode of administration, Mr. Donovan remarks§:—

"I am of opinion that of all the preparations, the only one to be relied on is the tincture of the resin, prepared in India from hemp collected at the proper season.

* Dr. Royle's Illustrations of the Botany of the Himalayan Mountains, p. 334.

† On the preparation of the Indian Hemp or Gunjal, Calcutta, 1839.

‡ Pereira's Materia Medica, vol. ii, 2d ed. p. 1098.

§ Dublin Journal of Medical Science, January 1845, p. 363.

"As to the modes of administration, I have tried many, and find the following to be the best:—

℞* Tincturæ resinæ cannabis Indicæ ℥xv.
Spiritus rectificati ℥xlv.
Misce: fiat haustus.

"The patient should be directed either to swallow the whole of this directly from the bottle, to avoid loss, or to pour it into a little water, and *instantly* swallow it off. If it be not taken instantly, the resin will be precipitated, will adhere to the vessel, and thus escape being swallowed. This always happens when the prescriber directs water to be mixed in the draught by the apothecary; and I have seen several disappointments in consequence. The form of emulsion does not succeed; for although the resin is at first diffused, it sooner or later separates. The practitioner should be also on his guard to order the tincture of the resin, lest tincture of the herb be used, which in small quantities is powerless."

Mr. Donovan reports several cases of neuralgia, which, he says, are not a *selection of the successful cases out of many*, but a faithful record of *all* that came under his observation, of which the termination was distinctly known. It appears that far more than the majority of them were cured by the agency of the hemp, and that all the rest were more or less relieved.

The most remarkable effects observed by Mr. Donovan were giddiness, confusion of ideas, great diminution of feeling, and sound sleep. He says the effect on the sensorium is generally alarming to the patient as well as to the bystanders, unless they were previously made aware of what was to be expected. Some patients evince great terror of death; but on recovering from the fit of narcotism, they laugh at their fears, and are generally ready for another trial. The aphrodisiac effects of hemp have been insisted on by all oriental writers. Among all the instances of its administration to male patients, Mr. Donovan observed this effect in one only. In no case did it produce those rapturous ideas and ecstatic dreams described by the oriental writers. In only one or two were the ideas even pleasing; and some were singularly depressed, and under apprehension of immediate death. All writers agree in attributing to Indian hemp the effect of exciting hunger, and this often in a voracious degree. This effect has been repeatedly observed by Mr. Donovan. He says the reflecting portion of the profession will decide for themselves whether, as ministers of relief to the sick, they are at liberty to withhold an impartial trial to a medicine of such approved power, and expresses his belief that Indian hemp will one day or another occupy one of the highest places amongst the means of combating disease.

2. *On the pharmaceutical and chemical characters of the Peruvian matico.* Dr. Hodges states that about five years ago, he received a parcel of the leaves of the matico from a friend who had resided many years in Peru. The latter informed him that they were universally regarded by the native practitioners of that country as a most valuable remedy in various diseases, and also related several marvellous stories, current among the Indians and European settlers, of their power in arresting the most violent hemorrhages, particularly those connected with

* One drachm of the tincture contains three grains of the resin.

the bladder and urinary organs. As the leaves have not been subjected, so far as we can ascertain, to a careful chemical examination either in this country or on the continent, the following observations may be interesting:—It is, we believe, to Dr. Jeffreys of Liverpool, that we are indebted for the first notice, in this country, of the medicinal virtues of the matico.*

Its action, when applied externally as a styptic, has been established in the practice of Dr. Munro,† of Dundee; and Dr. Lane,‡ of Lancaster, has also lately communicated the results of his experience regarding its internal administration, which are confirmatory of its South American reputation. On the Continent, a short notice of it has appeared in the *Pharmaceutische Central Blatt*, January 1843, by Dr. Martius; and a brief and imperfect account of it is also given in the Dictionnaire of Mérat and Lenz. It is stated by Dr. Martius that like the gunjalh which the East Indian prepares from the *cannabis Indica*, the leaves and flowers of the matico have been long employed by the sensual Indians of the interior of Peru to prepare a drink, which they administer to produce a state of aphrodisia.

The botanical history of the matico appears to be but imperfectly known; and there exists a difference of opinion even as to the class of plants from which it is derived; Dr. Martius, in the Pharmaceutical Blatt, considering it to belong to the *Phlomis* tribe, while in the *Flora Peruviana* it is described as a *Piper*. By immersing a specimen of the plant in warm water, we were able to examine it with considerable accuracy; and certainly its characters appear very unlike those which belong to the *Phlomis* family. The stems are woody, round, and pubescent; the leaves sessile, acuminato-lanceolate, rugose, and crenate, their upper surface of a dark green, and their lower of a pale green colour.

It is said that the name of the plant is derived from a Spanish soldier named Matico, who, lying desperately wounded, and bleeding to death, in his agony caught accidentally some of its leaves, and by their application arrested the hemorrhage, and healed the wound. The leaves have a strong, aromatic, slightly astringent taste. From experiments which Dr. Hodges has made, he concludes that they contain the following constituents:—1, Chlorophylle; 2, a soft dark green resin; 3, a brown colouring matter; 4, a yellow colouring matter; 5, gum and nitrate of potash; 6, a bitter principle, maticine; 7, an aromatic volatile oil; 8, salts; 9, lignin. The leaves of the matico are easily reduced to a fine powder, which has the colour of powdered senna. When mixed with any thick vehicle, as syrup, &c., it presents an excellent mode of administering them, though only adapted for extemporaneous prescription; as the essential oil, upon which it is probable much of their medicinal effect depends, would be rapidly dissipated by keeping, the cold infusion, as it extracts all the active principles contained in the plant, seems the best form for obtaining its medicinal properties.§

3. *Preparation and medicinal employment of valerianate of zinc.* The valerianate of zinc first proposed as a remedy by Prince Louis Lucien Bonaparte, has for some years occupied an important place among the

* Transactions of the Provincial Medical Association, vol. ii, p. 347 366.

† Provincial Medical and Surgical Journal, June 18th, 1842.

‡ Medical Gazette, October 6th, 1843, p. 9.

§ Condensed from the proceedings of the Chemical Society.

medicines of Italian physicians, and during the last few months it has got into great favour both in this country and in France. Under these circumstances, a review of what has been published relating to it will interest many of our readers.*

Valerianic acid, discovered by Planche, was isolated by Grote, and investigated by Penz. It preexists in the root of the valerian, but it may likewise be readily produced by acting with caustic potash upon potato fused oil. It is a volatile fat acid, colourless, soluble in every proportion in alcohol and ether, and soluble in about thirty times its weight of water. To obtain it, the valerian root is distilled, until the product has no longer an acid reaction; the essential oil which floats on the surface of the distilled water is separated, and the acid which it retains removed by shaking it with solution of caustic potash; the distilled water is saturated with carbonate of potash, the liquids mixed, and then evaporated to dryness at a very gentle heat; the residue introduced into a retort, and distilled with a suitable proportion of dilute sulphuric acid, affords a saturated aqueous solution of valerianic acid, on which some pure valerianic acid floats. Two pounds of valerian root afford about 2 grms. of acid.

To convert it into valerianate of zinc, it is saturated with the carbonate, or, still better, with perfectly pure oxide of zinc, recently precipitated. The action is assisted by heat, the hot solution filtered, and allowed to crystallize on a gently heated sand-bath. The crystals form light nacreous laminæ of a brilliant white colour. According to M. Duclos, cold water dissolves one fiftieth of its weight, and boiling water one fortieth. It is scarcely soluble in ether, but 100 parts of boiling alcohol dissolve 6 parts.

The physiological effects of the valerianate of zinc are scarcely more decided than those of the valerian, or of the zinc, taken separately. It has been greatly extolled as a powerful tonic and antispasmodic, and it is particularly in the case of tic douloureux, which cannot be subdued by the ordinary antispasmodics, that its efficacy is said to have been confirmed by Dr. Devay, of Lyons. But notwithstanding its brilliant success, it may fairly be questioned whether it is in reality a more efficacious remedy than the ordinary salts of zinc, and whether much of its success amongst a certain class is not in a great degree attributable to the rarity and the high price of the drug. That such is the case, is to a certain extent proved by the observations of Dr. Fario, an Italian physician, as quoted and commented on in the *Gazette Médicale de Paris*, 1844.†

4. *Valerianate of quinine.* This salt is prepared by adding valerianic acid, in slight excess, to a concentrated alcoholic solution of quina. The solution thus formed is to be diluted with twice its volume of distilled water, and then submitted to a heat not exceeding 122° Fahr. As the spirit evaporates, the valerianate of quina is deposited in fine crystals, either isolated or grouped, which augment from day to day.

It has a slight smell of valerianic acid, and a bitter taste resembling that of quina. It dissolves easily in water at ordinary temperatures, and still more easily in alcohol. Dr. Devay, of Lyons, has arrived at the following conclusions with regard to its therapeutical action:

1st, That the valerianate of quina is a more powerful *antiperiodic*

* Journal de Pharm. August 1844. Chemical Gazette, 1st November, 1844, and London and Edinburgh Monthly Journal, January 1845.

† See London and Edinburgh Monthly Journal, January 1845, p. 67.

than the sulphate of the same base, even when administered in smaller doses.

2d, It seems indicated, from its specific actions, as a valuable remedy in fevers of the worst character. (*Journal de Pharmacie* and *Pharmaceutical Journal*, March 1845.)

5. *On the iodides of quina and cinchona.* Dr. A. T. Thomson* has recently succeeded in preparing an iodide of quina, and of cinchona; two compounds which we agree with him in thinking, are likely to form valuable additions to the materia medica, inasmuch as they contain in themselves the combined properties of a most efficient tonic and one of the most valuable deobstruents which we possess. One of the great objections to the administration of iodine and iodide of potassium, is the production of that derangemennt of the system denominated *iodism*. Now this is likely to be prevented by the tonic influence of the quina or cinchona. It is true that we already possess such a combination in iodide of iron, but in many instances, where the influence of such conjoint powers is required, preparations of iron cannot be borne.

The *iodide of quina* is prepared by triturating together, in a mortar, 164·55 grains of pure quina, and 126·3 grains of iodine; the latter being added to the former until the whole is intimately mixed; and then boiling the mixture in a moderate quantity of distilled water at first, adding more by degrees, until as much is added as will give one grain of the iodide for each fluid drachm of the solution. During the boiling, a deep-brown resinous-like substance is formed, apparently insoluble in water, which subsides to the bottom when the solution cools.

This substance is brittle, tasteless, inodorous, and affords no indication of the presence of either iodine or quina; it is partially soluble in boiling alcohol. Dr. Thomson has not been able to ascertain its nature.

The iodide of quina, in solution, is of a pale straw colour, limpid, evolving a faint odour of iodine, and impressing upon the palate the bitter of quina; that it contains no free iodine is evinced by testing it with starch, whilst the existence of the iodine is immediately demonstrated by the development of the deep indigo-blue colour of the iodide of amidine, on adding a drop of nitric acid to the solution containing the starch. The quina in the solution of the iodide is precipitated by the infusion of galls in the form of a tannate; and, in its simple state, when the solution of pure potassa is added to the solution. It is upon these grounds, namely, the existence of both iodine and quina in this compound, that Dr. Thomson has been induced to name it iodine of quina; but the real nature of the salt contained in the solution has yet to be determined.

The iodide of cinchona is prepared in the same manner as the iodide of quina, taking 156·55 grains of the alkaloid, instead of 164·55. The quantity of brown resinous-like matter is less than in the preparation of the iodide of quina; but it closely resembles it in its physical characters, its insolubility in water, and its solubility in alcohol. The solution is nearly inodorous, has the bitter taste of the cinchona, and a rather deeper straw-colour than the solution of iodide of quina. It is limpid, and answers to the same tests as the iodide of quina.

Dr. Thomson has not yet crystallized either of these salts, but he will do so, and pursue his investigations both respecting their chemical cha-

* Pharmaceutical Journal, March 1845.

racters and their medicinal influence, and lay the results before the Pharmaceutical Society.

6. *Adulteration of sulphate of quinine, and a method of detecting it.* The sulphate of quinine of commerce is very frequently adulterated with *salicine*. If the proportion of the latter alkaloid be half or even one fourth, M. Peltier states that the fraud may be detected by the addition of concentrated sulphuric acid, which produces with salicine a characteristic red colour. But if no more than a tenth of salicine is mixed with the sulphate of quinine, this red colour is not developed by the addition of sulphuric acid. In order to detect the presence of salicine in this or less proportions, this alkaloid must be isolated. For this purpose, take three or four grains of the suspected sulphate of quinine, and pour on it about six times its weight of concentrated sulphuric acid, which dissolves the salt, and if salicine be present, forms a solution of a brown colour, just like sulphuric acid soiled by some vegetable matter. To this add carefully and gradually some distilled water, until a white precipitate appears. This will probably be salicine, which will not dissolve in a moderately dilute acid solution of sulphate of quinine. Filter the liquid and collect the precipitate on a watch-glass, and it will now produce, upon the addition of concentrated sulphuric acid, the bright red colour characteristic of salicine. If too much water be added, the precipitate will dissolve, and only a loose gelatinous precipitate will form, very difficult to separate.

7. *A new method of preparing mercurial ointment.*† The irritation of the skin so frequently produced by blue ointment, prepared in the old way, led Orosi to the idea of using precipitated metallic mercury with fresh lard. The reduction of the salts of mercury to the metallic state, is, as is well known, effected by phosphorous acid, or protochloride of tin; the latter of which is employed by Orosi. He dissolves one pound of corrosive sublimate in a sufficient quantity of boiling water, and mixes an excess of protochloride of tin, with an addition of muriatic acid, with the solution. The mixture is now shaken at a moderate temperature for a short time, and the finely-divided gray mercury is allowed to settle. When the fluid is poured off, the precipitate should be well washed with warm water, dried between bibulous paper, and then mixed with the prescribed quantity of fresh lard. The fine state of division of the precipitated mercury renders this preparation of the ointment very expeditious. The only difficulty encountered in this method is the readiness with which the precipitated gray mercury forms metallic globules, especially if the precipitate be allowed to stand too long, and dry after pouring off the fluid. This union of the globules may, however, be prevented, by covering the interior of the vessel in which the mercury is precipitated with fat.

Ointment prepared on Orosi's plan exhibits no globules of metal under the lens, and can at the most only contain a trace of oxide of tin, if sufficient muriatic acid be not employed in the preparation, or the precipitate be inadequately washed. Ointment prepared in this way is certainly more expensive, but is free from all rancidity, and does not require much rubbing down.

8. *Mode of expelling blood from leeches.* Mr. Boyce‡ expresses his

* Journal de Chimie Médicale, and Lancet, Jan. 11, 1845.

† Buchan's Repertorium, and Pharmaceutical Journal, Feb. 1845.

‡ Pharmaceutical Journal, Jan. 1845.

belief that among the various means used for emptying leeches of the blood they have drawn, none will be found more simple and innoxious than to immerse them in a little mistura camphoræ for a few moments, when they readily vomit all the blood, and should then be put into clean water, which should again be changed in half an hour. For that disease, attended with a vomiting of dark-coloured matter, of which so many die, Mr. Boyce has used it as a remedial agent, immersing them in it twice a week, and he believes the mortality was much diminished in consequence.

VII.

REPORT ON THE PROGRESS OF FORENSIC MEDICINE.

In reviewing the progress of this department of medical science, it is proposed to adopt as nearly as possible the order suggested by the relative importance of the subjects which it comprises. The first place, therefore, will belong to Toxicology. The retrospect of the first half of the present year is limited chiefly to the contents of the English journals; that of the last half of the year will extend to the contents of the Foreign journals for the entire year, together with those of the English journals published during the latter half of the year.

§ I.—*Toxicology.*

1. *Poisoning by Prussic Acid.* The trial of Tawell for the murder of Sarah Hart has given to this poison an unusual degree of interest, and has led to the publication of other cases, as well as to that of experiments and observations on the action of the poison and of some of its more active compounds.

Six cases of poisoning by prussic acid have been communicated to the English journals, of which two were joint acts of suicide. Five of them were fatal, and one recovered. These cases will be given in full; and will be succeeded by a short commentary on some of the more important features which they presented. The first case is that of Sarah Hart, the victim of Tawell. The post-mortem appearances in this case are described by one of the medical men who gave evidence on the trial.

Cases of Poisoning by Prussic Acid.

Post-mortem examination of Sarah Hart, *by order of* John Charsley, *esq. Coroner for Bucks, Jan.* 2, 1845, 18 *hours after death. By* E. W. Norblad, *Surgeon; Slough.*

The deceased was 41 years of age, of small stature, rather spare habit, fair complexion, light hair inclining to gray, pale face naturally.

The body was lying on the floor of the room as she died; the head on a pillow, jaw tied up. The left stocking was half down the leg, there were no shoes on the feet, and the head was without a cap. The shoes (slippers) and a cap were on the opposite side of the room when the body was found by a neighbour.

The surface of the body was pale, the extremities were rigid, a little animal heat still existed in the fleshy parts of the thighs, the countenance had a calm expression, the pupils were half-fully dilated, there was no odour about the body but the usual cadaverous smell.

The body was next stripped. There were no marks of violence any

where discoverable; the under garment was extensively stained with blood. It is stated that deceased never used the *usual protection* during the menstrual period, and that function was going on at the time of her death.

The thorax and abdomen were laid open. There were rather extensive adhesions of the pleural surfaces on both sides of the thorax, and a white patch, the size of a shilling, on the heart. These morbid appearances were of long standing; the adhesions were very firm, some close, others of considerable length.

The heart was flaccid, but full of blood on the right side; there was no fluid of any description, exceeding the usual serosity, in the pericardial or pleural sacs.

The larynx, pharynx, and trachea, were free from obstruction or disease. The lungs were healthy; no tubercle, induration, abscess, or other disease. The cavities and valves of the heart were perfectly healthy.

There was *no odour* differing from that of an ordinary dead body in the thorax or abdomen. The *closest possible attention* was paid to this point, by the two other medical men who were present, and we were all agreed on this point.

Some adhesions of the convex surface of the liver to the diaphragm existed: they were of much the same appearance as those in the thorax, and probably of consentaneous origin. There was no recent disease. The abdomen was loaded, but not burdened, with fat; its venous system was filled with black fluid blood. The stomach was about half full; the gall-bladder contained but a small quantity of bile; the substance of the liver quite healthy.

The veins of the pelvic cavity were very full of blood, especially those of the ovaria, fallopian tubes, and uterus. This viscus was somewhat increased in volume, and felt rather spongy between the fingers. The bladder was empty, but *flaccid*. The external genital organs were of a blueish cast of colour; they were free from injury; there were no appearances as of connexion having recently taken place. The fore-finger passed up the vagina was withdrawn smeared with sanguineous secretion. The os and cervix uteri healthy. A section of the uterus showed its structure of a pink hue; the parietes a little increased in volume, and its interior containing sanguineous secretion and mucus; it was unimpregnated. The ovaria were healthy. The kidneys were quite healthy; the cortical and tubular portions distinct, and of the usual contrasting appearances.

The œsophagus, stomach, and duodenum, were now removed, and the stomach laid open. It contained rather more than half a pint of pulpy contents; consisting of chyme, with a few shreds of coarse beef (apparently salt boiled), and some portions of apple.

The whole contents had an intensely sour smell, exactly resembling that of food rejected an hour or two after the commencement of digestion from a disordered stomach; but there was no odour that could possibly be considered in any respect like prussic acid. The contents were hermetically sealed for analysis.

Some tenacious mucus smeared the interior of the stomach; there was no unusual vascularity.

The head was next opened. The venous system was filled (not gorged, hardly distended) with black and fluid blood; there was no extravasation

of blood or effusion of serum in the arachnoid sac. The brain was removed: its vascular system was in a state of integrity, the circle of Willis naturally formed. Careful sections of every part of the cerebrum and cerebellum were made: there was no effusion of blood, abscess, or tumour of any part.

The vertebræ were all sound.

The sudden manner of death in this case, and absence of the characteristic smell of prussic acid, naturally led to the inference that if any poison had been taken, it would prove oxalic acid: the usual tests were therefore tried for this poison, but with negative results; and the same may be said of all the ordinary mineral and acid poisons. But prussic acid was unequivocally proved, by chemical analysis, to be present, and in considerable quantity.*

Case of Poisoning by Prussic Acid, communicated by Mr. Newham, *of Bury St. Edmunds, to* Mr. Alfred Taylor.†

A commercial traveller was found dead in his bed at an inn. As there was a suspicion that the deceased had died from poison, an inspection of the body was ordered, and performed by Mr. Creed. The body was first seen by him about ten or eleven hours after death. The deceased was lying in the recumbent posture inclined to the left side. The arms were bent across the chest, and were very rigid; but the hands were not clenched, nor was there any appearance indicative of convulsions before death, the body lying in the natural position of rest. One leg was slightly bent, and the lower extremities and abdomen were warm. The countenance was natural, but very pale, and without the slightest expression of suffering. The eyes were open and particularly bright; the lips were purple, and retracted so as to show the teeth and part of the gums; and about the mouth, there was decidedly the odour of prussic acid. It further appears that the bed-clothes were smoothly drawn up to the deceased's shoulders, and there was no appearance whatever of disorder about them. There had evidently been no struggling before death. On a chair, at the back of the bed, but close to it, was found a phial *with the cork in it.* This phial, in the opinion of Mr. Creed, had contained prussic acid, mixed with some essential oil, probably the essential oil of lemons. There was a small portion of liquid remaining in the bottle when it was found.

The following were the post-mortem appearances. *Head.*—The membranes of the brain were perfectly natural in every respect; the substance of the organ was also firm and natural. The quantity of serous fluid contained in the ventricles was less than usual, but it was strongly impregnated with the odour of prussic acid. The plexus choroides was pale and bloodless. *Chest.*—The lungs were healthy; at the upper part the organs were of a light red colour; at the lower part they were full of a dark-coloured, muddy-looking blood. The heart was natural, but contained very little blood, and this was of a dark and muddy hue, and strongly impregnated with the odour of the poison. *Abdomen.*—The liver was larger than natural, and there were several spots of medullary deposit about it. The gall-bladder was nearly empty, and the bile was dark-coloured. The pancreas was healthy, and the spleen, externally, was of a very bright violet-purple colour. The urinary bladder was natural; it

* Medical Gazette, January 11, 1845.

† Guy's Hospital Reports, April 1845.

contained no urine. The stomach contained more than half a pint of a viscid liquid, having a strong odour of prussic acid. A portion of the mucous membrane, at the greater curvature, was highly injected and inflamed being of a deep red hue. The intestines were healthy, but generally empty; the mucous membrane of the duodenum was slightly inflamed in patches; and on being laid open there was a strong odour of the poison. The lower portion of the great intestines was quite empty, the deceased having involuntarily passed the fæces and urine, probably in the act of dying, and while under the influence of the poison.

The stomach, with its contents, were forwarded to Mr. Taylor for examination, but at so late a period that the analysis could not be performed till the twelfth day after death. As might be anticipated at so remote a period, there was no odour of prussic acid either in the contents of the stomach or in the products of distillation; nor did either of the tests for prussic acid succeed in detecting the presence of the poison. The evidence given at the inquest leaves no doubt that the case was one of suicide. The quantity of the poison taken was probably about three drachms, of which the strength was not ascertained, and of which the odour was disguised by the essential oil of lemons.

The case is accompanied by an instructive commentary by Mr. Alfred Taylor.

Cases of C. W. Duckett and Elizabeth Williams. By H. Letheby, M.B. *Professor of Chemistry, London Hospital.**

On Monday, Nov. 25th, I was requested by the coroner to make a post-mortem examination of the bodies of C. W. Duckett and Elizabeth Williams, both of whom had died suddenly during the night, having previously been in good health; the former was aged twenty-one, the latter twenty-seven.

I found them lying upon the bed, with their clothes on, and in such a natural position that at first sight any one would have supposed that they were merely sleeping. He lay upon his back, with his right arm under and around the waist of Miss Williams, the fingers being a little flexed, as if they had suffered from a very slight spasm at the time of death; the other hand lay open and composed upon the left thigh. His features, too, wore the calm, smiling expression of a person who had died without the least agony or convulsion.

Miss Williams exhibited the same placidity of countenance; she lay on her left side, with her head resting upon one hand, while the other was thrown over the body of her lover, as if in an affectionate embrace; her legs were extended, and a little crossed, in the common position of one asleep, the dress covering them to the feet; nor were her clothes anywhere disarranged or tossed, although this must have happened if she had struggled in the act of dying. On raising her head, I observed that some colourless fluid, probably saliva, had trickled from her mouth, and this, as well as her lips, smelt strongly of prussic acid. The lungs of both were found to be quite free from disease, but so completely gorged with blood, especially upon the most dependent parts, that they looked nearly black, and felt heavy and solid. The right side of the heart was filled with the same dark blood, while the left was nearly empty; indeed, everywhere the blood had an unusually dark colour, was uncoagulable, and had a strong odour of the poison.

* Lancet, December 14, 1844.

The abdomen presented nothing abnormal. The stomach of each contained about a pint of thick fluid, like soup, having the smell of hydrocyanic acid, and when examined internally, was found to be a little redder than usual, except at one or two places, where it had lost colour, and assumed a yellowish white tint, through which patches of red points appeared, as if blood had been effused in minute dots.

On distilling the contents of the stomach with a little dilute sulphuric acid, and then precipitating with nitrate of silver, I obtained forty-seven grains of cyanide of silver, known to be such by its perfect solubility in boiling nitric acid; this indicates about one ounce of Pharmacopœial prussic acid.

In the evidence it appeared that the deceased gentleman had purchased two ounces of prussic acid, and no doubt they drank it simultaneously while they sat upon the bed, for two tea-cups were found close by them.

Remarks.—It appears to me that there are several points of most especial interest connected with these two cases. Thus the parties were both young, in good health, and they must have taken each about one ounce of the poison, and have died immediately, without the least struggle or convulsion. Now, out of the great number of experiments which I have made upon animals, I do not remember ever to have seen death produced, even by the most potent dose of prussic acid, without some convulsion, and generally there is a very great deal; I must confess, therefore, that if there had been anything about this, or any other such case, which could by a possibility have attached suspicion to a third party, I should most assuredly, though, perhaps, most unjustly, have given my evidence against that party; for the conclusions drawn from my experiments would have pronounced it perfectly impossible for death to have resulted from prussic acid without its leaving some indications of struggling; and I should, no doubt, have believed, from the calm and apparently studied positions of these bodies, that all such indications had been designedly removed. I do say, then, that cases of this kind should teach us caution in giving evidence, however well our opinions may be grounded, or from whatever source they may be drawn. Another interesting point, with reference to the action of the poison, is, that the blood assumed a dark colour, was uncoagulable, and had the odour of the acid. The lungs, too, were excessively congested, as was also the right side of the heart; all of which indicates that the immediate cause of death is, the stoppage to respiration and the accumulation of blood in the lungs. This cannot be dependent on a deficiency of the heart's action, for every one who has been accustomed to these inquiries knows that the heart continues to beat for some time after all the evidences of death have set in; and this would be suggested, too, by the empty condition of its left side. I have no doubt that the immediate action of hydrocyanic acid is upon the nervous centres, and through them the true and semi-voluntary muscles become fixed or tetanic, and respiration is in this way prevented. We hear the expiratory shriek; see the spasm of the limbs, and the evacuation of the stomach, rectum, and bladder.

In all three of the cases of poisoning by prussic acid which have recently come under my notice, I have observed the peculiar condition of the stomach, which I have attempted to describe—namely, the partially congested state of its general internal surface, with the occasional white patches and red dots. The last fact to which I refer is, that the smell of the poison was very evident about the mouth, although both these bodies must have been dead at least twelve hours when I examined them.

A letter from Mr. G. Davies, published in the Lancet of the following week, makes one or two slight corrections in the foregoing account, by Dr. Letheby. Instead of the odour being observed twelve hours after death, Mr. Davies states that it must have been seventeen or eighteen hours. With regard to the position of the bodies, he states that that of the young man was in the posture described by Dr. Letheby; his countenance perfectly natural: the lady was lying on her side, with her head upon her lover's breast, her ringlets flowing over his chest and shoulders, her arm round his waist. Upon taking hold of her wrist I found it quite cold, and the arm so rigid, that upon raising it, her head slipped into the situation found by Dr. Letheby.

Case of Mr. Holmes. Lancet, February 15, 1845.

Mr. Holmes left his house on horseback, on the afternoon of Wednesday, on professional business. At about four he returned, went into the house, and complained of being much fatigued. After some cheerful conversation, he expressed a wish to be left alone, as he was sleepy. His brother, Mr. James Holmes, and deceased had some conversation on their professional business, and he was then, at his own request, left to his repose till about six o'clock. His servant said he was then sitting in his chair, leaning back, and did not seem well. She said, "You had better go to bed." As I left the room, I saw him go out of the opposite door to that at which I was leaving, into the surgery. I returned almost immediately, and as I came into the room I heard a noise as if he were sick, at the same time I heard something drop to the ground. That was the bottle now produced. I looked towards deceased, and saw him falling. He put his arms out to save himself. He fell rather forward. I ran to deceased, and lifted him up, and fetched a jug of water, of which I poured some down his throat, and threw some over his face. I then told the boy to run to Mr. James Holmes, and fetch him, as he had gone out. He came home immediately. This was ten minutes from the time of deceased falling. He gave him an emetic. Deceased's pulse was then hardly perceptible. As soon as the boy had returned from calling Mr. James Holmes, I sent him to Cirencester for Dr. Kenneir, but deceased was dead before he could get there. He breathed his last about twenty minutes or half an hour after his housekeeper heard him fall to the ground. The bottle was labelled "hydrocyanic acid, of Scheele's strength. Minimum dose, one drop." The bottle was a little less than half full when picked up. It would have held half an ounce more. The cork was in. Mr. Holmes had killed a cat with a little of it a short time before. She did not know if he had been in the habit of taking any of it himself. Mr. James Holmes said his brother occasionally complained of a pain in his head, and occasionally in his right side. He had also a slight cough. He took medicine every week. Frequently, when he had complained of pain, he had seen him take a little prussic acid by touching his tongue with the cork of that bottle. About six months ago deceased had been heard jocularly to remark upon the strength of the dose he had taken, as it had made him giddy. He was as cheerful as he had ever been in his life on the evening of his death. Dr. Kenneir and Mr. Pooley were requested to make a post-mortem examination of the body. They had no doubt deceased died from taking prussic acid. The remedies administered were brandy and

ammonia. The jury, after a short consultation, returned a verdict to the effect, "that deceased had died from accidentally taking an overdose of prussic acid."*

To these fatal cases of poisoning by hydrocyanic acid must be added the brief particulars of a case of recovery from poison related to a meeting of the Sheffield Medical Society by Mr. Harthill. He was summoned to a soldier, aged 23, about nine o'clock in the evening of the 15th of January, and was informed that he had taken poison. He found him insensible, with convulsions. The mouth having been forced open, emetics of mustard and sulphate of zinc were exhibited. Mr. Harthill sent to Mr. Law, at the infirmary, who arrived shortly with a stomach-pump, which was used for injecting the stomach, for the tube could not be introduced far enough to withdraw any fluid. A stream of cold water was applied to the spine, and turpentine enemata administered. The effects of the cold water were instantaneous, feeling and consciousness becoming immediately evident; powerful stimuli, brandy and ammonia, were administered; sinapisms were applied to the thighs, and in about four hours, eight minims of tincture of opium were given. The next day he was much recovered, and has since been sent to headquarters. A phial smelling very strongly of the poison was found, but the quantity taken was not ascertained.

The cases of poisoning by prussic acid, now detailed or referred to, serve to throw light upon some interesting and important questions likely to arise in courts of law. It may be well, therefore, to point out the leading facts established by these cases.

The *odour* of the poison was, according to the statement of Mr. Norblad, absent in the case of Sarah Hart, 18 hours after death. On the other hand, in the case reported by Mr. Newham, it was present 11 hours after death in the corpse itself, in the stomach, in the blood contained in the cavities of the heart, and in the serum effused into the ventricles of the brain. Again, in the cases of C. W. Duckett and Elizabeth Williams, reported by Dr. Letheby, the odour of prussic acid was distinctly perceived about the mouth 12 hours, but, according to Mr. G. Davies, seventeen or eighteen hours after death. The contents of the stomach and the blood were also strongly impregnated with the smell of the acid. In the case reported by Mr. Newham, the odour of the acid seems to have overpowered that of the oil of lemons with which the acid was mixed. The statement of Mr. Norblad, above referred to, was not borne out by the evidence of all the medical witnesses in the trial of Tawell, for two out of five witnesses declared that they had perceived the odour of the poison.

On this subject there are some useful observations by Mr. Taylor in an appendix to Mr. Newham's case. (*Guy's Hospital Reports*, April 1845, p. 71.) He succeeds in establishing the proposition, "*that a liquid may have the odour of prussic acid when chemical tests fail to detect the poison.*" In confirmation of this statement he adduces the researches of Dr. Lonsdale, who says that, in his experiments on dogs, he could perceive the odour for eight or nine days, although he could not detect the acid chemically for more than four days after death; several experiments of his own tending to a similar conclusion; and the statements to the same effect of Orfila and Christison; and he concludes by coinciding with the principle

* Lancet, Feb. 15, 1845.

laid down by the judge on the trial of Tawell, "*That smell was a proof of its presence, but that the absence of smell was no proof of its absence.*"

Among the causes which may prevent the odour of prussic acid from being perceived may be mentioned long exposure, smallness of dose, absorption, dilution, and the predominance of other odours. These points are commented on in Mr. Taylor's essay already referred to.

One of the most important questions connected with poisoning by prussic acid is the *duration and amount of voluntary motion possible after taking a fatal dose of the poison.* In Mr. Newham's case, it is stated "that the bed-clothes were smoothly drawn up to the deceased's shoulders, and there was no appearance whatever of disorder about them. There had evidently been no struggling before death. On a chair, at the back of the bed, but close to it, was found a phial with the cork in it." The deceased must therefore have swallowed the poison, corked the phial, placed it on the chair close to his bed, and drawn up the bed-clothes before he lost all power of voluntary motion. In the double case of suicide reported by Dr. Letheby, the deceased, after drinking the poison from two tea-cups, which were found close by them, had time to assume the position described by him, and they died apparently without a struggle. Mr. Holmes, according to the report of his servant, after letting the bottle from which he had drunk the poison fall from his hand, put out his arms to save himself, and then fell to the ground. He does not seem to have performed any other act of volition.

The presence or absence of *convulsions* is another point of much interest, and of some importance. The absence of convulsions may be inferred from the composed appearance of the countenance, and the natural posture of the body. The countenance of Sarah Hart is stated by Mr. Norblad to have had a calm expression. In Mr. Newham's case, "the countenance was natural, but very pale, and without the slightest expression of suffering, either mental or bodily;" and from the appearance of the bed-clothes, it was inferred that "there had evidently been no struggling before death." Dr. Letheby infers from the position of the bodies of Duckett and Miss Williams, that they died immediately, "without the least struggle or convulsion." In Mr. Holmes's case, no mention is made of convulsions; but in that of the soldier, Mr. Harthill is stated to have found him "insensible, with convulsions." It would appear then that convulsions are by no means constant symptoms of poisoning by prussic acid, but that they are of occasional occurrence. The same inference is to be drawn from experiments upon animals to be presently mentioned, with this difference, perhaps, that in animals convulsions are the rule, but in man the exception. The other symptoms and the post-mortem appearances do not require any special notice. For information on these subjects, it will be sufficient to refer the reader to the cases themselves.

Treatment of poisoning by prussic acid. The excellent effect of the cold affusion is displayed in the case of the soldier. "The effects of the cold water (applied to the spine) were instantaneous; feeling and consciousness became immediately evident." The rest of the treatment in this case consisted of emetics of mustard and sulphate of zinc, the injection of the stomach by means of the stomach-pump, a turpentine enema, sinapisms to the thighs, and the use of brandy and ammonia.

Experiments on animals. Mr. G. L. Blythe, of Maida Hill, in a letter addressed to the *Lancet*,* states that he poured about a drachm

of Scheele's acid on the nose and mouth of a cat. "The poor thing a first appeared stupefied, and in about 10 or 15 seconds it staggered, calmly stretched itself at full length, and expired without a struggle, or moan. What I more particularly wished to observe," Mr. Blythe adds, "was the 'expiratory shriek;' and I was the more astonished, as I had never before seen death take place in animals from the effects of prussic acid, without violent struggling, and one or more screams." From this experiment Mr. Blythe fairly infers the possibility of death taking place in the human subject without the expiratory shriek.

Mr. Alfred Taylor, in the course of his commentary on Mr. Newham's case of poisoning by prussic acid (*Guy's Hospital Reports*, April 1845,) alludes to the results of his own experiments on animals. Of these results the most important are the absence of the shriek or scream to which so much importance has been attached; the universal occurrence of convulsions; and the absence of all trace of such convulsions after death, though very strongly marked during life; and the variable period at which equal doses of the poison begin to act on different animals of the same species. "In some instances," he says, "I have observed that the effects were immediate; there was no appreciable interval, either to the person who held the animal or to myself, between the time of applying the poison to the tongue and the commencement of the symptoms. There were convulsions with opisthotonos in cats, and emprosthotonos in mice; but, in several instances, although the animal appeared of equal strength, and the dose was the same, the symptoms did not commence until after the lapse of from fifteen to thirty seconds." Dr. Letheby also, in commenting on the double case of suicide already referred to, states that in all his experiments on animals convulsions were present. In animals, then, we may consider convulsions as the rule, and their absence a rare exception.

Tests for prussic acid. Mr. Taylor has examined the delicacy of these tests, and states his results as an addition to his comments on Mr. Newham's case. The *nitrate of silver* test produces a milkiness with less than the 4000th of a grain of anhydrous prussic acid, in a minimum of water; but it only begins to give a decided precipitate with the 220th gr. in about 13000 parts of water. Even then all the properties of the precipitate cannot be brought out, because, from so small a quantity of cyanide of silver as is there formed, it is impossible to produce cyanogen in sufficient quantity for combustion. The smallest quantity of the cyanide of silver from which Mr. Taylor could obtain a flame was the *tenth* of a grain, equal to about the fiftieth of a grain of anhydrous prussic acid—a quantity contained in about *two drops* of the pharmacopœial acid, or in less than *one drop* of Scheele's acid. When the quantity of cyanogen is very small, Mr. Taylor has sometimes adopted the plan of receiving it on bibulous paper impregnated with the mixed oxide of iron, obtained by moistening the paper with potash, and then dipping it into a solution of the green sulphate of iron. On afterwards dipping the paper into dilute sulphuric acid there has been a distinct stain of prussian blue on the paper, clearly showing that cyanogen was one of the products of the distillation. The tube in which the cyanide is heated may be bent like a retort, and its point inserted in a few drops of water slightly alkaline, and holding the mixed oxides suspended. After the decomposition, the surplus oxide

* Dec. 28, 1844.

of iron may be removed by dilute sulphuric or muriatic acid, and prussian blue will be left, at once announced by its colour. Mr. Taylor adds a caution quite unnecessary when operating on a precipitate obtained from a distilled liquid, "that any organic (nitrogenous) matter, heated in contact with an alkaline base, or alkaline metal, will produce cyanogen. I have in this way," he says, "procured from the dried body of a small insect sufficient cyanogen to produce a perceptible quantity of prussian blue."

Prussian-blue Test. The point at which the oxides of iron begin to indicate the presence of prussic acid was the 50th of a grain of the acid in 3000 parts of water—a quantity equal to that required for the production of a sufficiency of cyanide for the evolution of cyanogen. It is added that this test "will more frequently answer than the silver test in the hands of those not much accustomed to analysis, because it is extremely difficult to procure cyanogen from very minute quantities of cyanide of silver."

The prussian-blue test likewise detects minute quantities of the oil of bitter almonds. "One drop of the oil, mixed with two or three drops of alcohol, and treated with sulphate of iron and potash, gave a well-marked precipitate of prussian blue. There can be no doubt that half a drop of the essential oil may be easily detected by this test." (*Guy's Hospital Reports, Second Series*, No. V. p. 39-75.)

2. *Poisoning by the Cyanides.* The results of some experiments performed by Dr. Letheby with these substances will be found recorded in three successive communications to the *Medical Gazette*.* The first paper is devoted to the cyanide of potassium, the second to the bicyanide of mercury, and the third to the cyanide of silver.

Cyanide of potassium. Dr. Letheby states it as the result of his experiments that, excepting prussic acid of a strength of 4 per cent., cyanide of potassium is the most virulent and active of all the compounds into which cyanogen enters. "Five grains of this salt, dissolved in two drachms of water, and given to a middle-sized dog, occasioned death in about seven minutes, producing all the symptoms of poisoning by hydrocyanic acid; and when it was given in larger doses, its action became the more speedy. For instance, in one experiment I gave half a drachm, in solution, to a spaniel, and before I had time to release the animal its effects had commenced: in 13 seconds the dog fell; and in 32 it lay apparently dead. There were from that time no further convulsions; reflex action had for the most part ceased; the eye could be touched without the lid winking, and the sphincters had relaxed. Yet, notwithstanding this, the heart continued to beat for six minutes, and in many instances I have known it pulsate between 8 and 12 minutes after life had apparently terminated." In cases of poisoning by the cyanides, there is always a smell of prussic acid in the stomach, whether the body be opened directly or some time after death. This is attributed to the liberation of prussic acid by the action of the gastric juice upon the salt.

Bicyanide of mercury. From some experiments performed with this poison Dr. Letheby infers "that two grains of bicyanide of mercury are sufficient to cause the death of small dogs; that it acts, when put into the stomach, as a powerful local irritant, occasioning violent vomiting, and subsequently purging and bloody evacuations. The constitutional

* Jan. 9, Feb. 4 and 17, 1845.

effects are first a loss of volition; the animal totters, and loses control over the limbs as if they were paralysed. The mental faculties, however, are not impaired, nor does there appear at this stage to be either pain or spasm. The second effect is like that of prussic acid, violent convulsions, loud screams, and a spasm of the respiratory muscles; for the time reflex action ceases, and the subsequent effects are paralysis of the voluntary, and afterwards the involuntary muscles, coma, the breathing becoming slower and slower, and the heart's action fluttering, and subsequently laboured. It at first appeared that these effects were rather due to a gradual liberation of hydrocyanic acid, which maintained a slow but constant action upon the system; but the fact that the same symptoms are produced when the salt is injected into the veins or peritoneum, leads to a belief that the effects are specifically those of the combined elements." The post-mortem appearances were "a highly congested state of the stomach, a semi-coagulated black blood, which fills the right side of the heart and cavæ, and a congested state of the vessels of the brain." Dr. Letheby's experiments with the bicyanide of mercury further show that prussic acid is liberated from the salt when it mixes with the acid contents of the stomach, and that both it and the mercury are readily detected. When the poison is given in a large dose, it produces such constant and violent vomiting that it is entirely expelled.

Cyanide of silver. The conclusions which Dr. Letheby draws from his experiments with this substance are, "that it acts as a local irritant, producing great vomiting, and a congested state of the vessels of the stomach; that when it has been dried before its introduction into the system, no other ill effects follow; but if it is administered in a moist state, it is then capable of becoming absorbed, and perhaps decomposed, for an albuminous solution has the property of dissolving the cyanide, and, moreover, the contact of it with any of the chlorides of the systemic fluids would produce a double decomposition, and the formation of a soluble cyanide, whose effects would be similar to that of cyanide of potassium. The dose which is capable of killing a dog is five grains; its specific action seems to be on the brain, producing occasional convulsions, always coma, paralysis, a peculiar sighing respiration, a fluttering, irregular, and tumultuous action of the heart, and it ultimately kills by a gradual exhaustion of the involuntary acts, death taking place in from one to three hours after its administration. The *post-mortem appearances* are a dilated pupil; an injected state of the vessels of the brain; the heart gorged and full of black blood, especially on its right side; and when the poison has been administered by the stomach, that organ is exceedingly congested, completely emptied of solid matters, and may smell slightly of prussic acid; but there is no difficulty in detecting chemically the presence both of cyanogen and silver."

The effects of this class of poisons on strong and healthy animals are thus summed up: an apparent giddiness; a staggering walk; an effort to vomit; the animal then generally fell, was convulsed, foamed at the mouth, made great efforts at respiration, shrieked, and died with a strong convulsive action of all the muscles of the body; the eyes stared; the limbs were extended, and the bladder and rectum emptied. When, however, the animal had been previously exhausted, either by bleeding or want of food, death took place for the most part quietly, without much struggle or cry."

3. *Hydrocyanic acid in organic liquids.* The following method of detecting this poison in organic liquids is quoted in the *Lancet*, Jan. 25, 1845, from Berzelius's Jahresbericht xxxiv, p. 269. "The contents of the stomach must be mixed with one sixth of their bulk of alcohol, and a fourth part is to be distilled off. If prussic acid was present, it will be detected in the distilled product by its peculiar odour; or by first adding to it a little caustic potash, and then an acid solution of the mixed protochloride and perchloride of iron, when prussian blue will be formed. If the poisoning was supposed to have been effected by a cyanide, hydrochloric acid will have to be added along with the alcohol previous to distillation." The advantages which this method may possess over the common process of distillation of the contents of the stomach by a water-bath are not stated, nor are they very obvious.

3. *Poisoning by Arsenic.* Next in importance to the subject of poisoning by prussic acid is that which usually holds the first place—poisoning by arsenic.

Tests for Arsenic—Marsh's Test. A scientific committee has been appointed by the Prussian government to examine the several methods proposed for the detection of arsenic, and to report upon them. They have suggested a modification of Marsh's test, which is certainly a great improvement upon the original form of apparatus. A strong glass tube an inch and a quarter in diameter, and ten inches long, is contracted at each end, the lower aperture being about half an inch in diameter. The upper opening is fitted with a cork through which passes a second glass tube two lines in diameter and ten inches long, terminated above by a stop-cock, to which it is joined by a short caoutchouc tube. A second narrow glass tube, free from lead, and eight inches in length, is connected with the stop-cock in the same way at right angles to it, and to the unattached end of this tube a third tube, bent downwards at right angles, is attached. The first-named tube is placed in a tall glass vessel from sixteen to eighteen inches high, and large enough to admit it easily.

Through the lower opening of the first-named tube long strips of zinc free from arsenic are to be introduced, and to be kept in their place by a spiral wire of copper inserted into the aperture The stop-cock being closed, a mixture of dilute sulphuric acid, with the suspected liquid, is now poured into the vessel till it stands just above the junction of the larger with the smaller of the inner tubes. The stop-cock is then opened so as to allow the liquid to rise into the inner tube, and the stop-cock is again closed. The gas generated in the inner tube forces the liquid back through its lower opening into the outer vessel. Any froth which forms during the operation may be destroyed by gently shaking the apparatus.

While the gas is being generated in the inner tube, the centre of the horizontal tube is heated to redness by an argand spirit-lamp, the end of the depending tube being immersed in water contained in a small glass vessel, When the horizontal tube is quite red-hot, the cock is opened to such an extent as to cause the gas to bubble slowly through the water. As soon as the inner tube is again filled with liquid, the stop-cock must be closed till the tube is again filled with gas. In this manner the operation is to be continued till a quantity of arsenic is deposited sufficient for the application of the tests. When the cock is closed, the tube is filled with hydrogen gas, so that we can apply the test of heat to ascertain whether the metal which has been deposited

has the volatility of arsenic. The arsenic having been thus collected in a distinct ring, the tube is removed, and a succession of similar tubes substituted in its place.

The character of the crust is now to be tested in the following way. One of the flat tubes is to be cut with a file near the part on which the metal is deposited, and to be placed in a small test tube containing fuming nitric acid, in which the arsenic is to be dissolved by the aid of heat. The solution thus obtained is then evaporated to dryness on a watch-glass over a water-bath, so as to drive off the excess of nitric acid. The arsenic acid thus formed is soluble in water, while antimonic acid, or the oxide of antimony, is insoluble. The arsenic acid gives, with a neutral solution of nitrate of silver, a dull-red precipitate of arseniate of silver. The arsenic contained in a second tube may be converted into arsenious acid, and identified by the form of its crystals (octohedrons.) The arsenious acid may then be washed out with a little distilled water containing some ammonia, and tested with dilute nitrate of silver. A third tube may be hermetically sealed, so that the crust may be produced in court.

The zinc and sulphuric acid should be previously tested in the same apparatus to ascertain whether they are free from arsenic. The depending tube may be reversed so that the gas may be ignited as it issues from it, and crusts be obtained on slips of glass, as in the original form of Marsh's apparatus.

Dr. Letheby (*Lancet*, March 15, 1845), among several objections of less force which he urges against this form of apparatus, mentions the frothing of the liquor, and the escape of particles of zinc from the central tube into the acid liquor without, whereby arseniuretted hydrogen will be generated and lost. In place of this process he recommends a modification of those proposed by Lassaigne and Reinsch. The filtered liquid obtained by boiling the contents of the stomach in distilled water, slightly acidulated with acetic acid, is divided into two portions, to one of which Reinsch's test is applied in the usual way. The other portion is evaporated to dryness, and heated with twice its bulk of strong sulphuric acid till it is quite charred. The residue diluted with distilled water is to be gradually introduced into a large Wolfe's bottle, in which hydrogen is being slowly evolved from pure zinc and dilute sulphuric acid. The resulting gas is to be conveyed through a bent tube drawn to a fine point into a solution of nitrate of silver. A black precipitate will be formed, to which muriatic acid is to be added till all the silver is precipitated, and a little of the acid remains in excess. The supernatant liquid is to be boiled for a few minutes, filtered, and evaporated to dryness: the residue, if there be any, is to be dissolved in a little distilled water, and carefully precipitated by ammoniacal nitrate of silver. The red arseniate of silver is formed, which may be reduced by means of black flux or charcoal. If the substance to be tested be a piece of muscle or liver, it must be charred by means of sulphuric acid, and the resulting liquid being divided as before into two portions must be submitted to the two processes of Reinsch and Lassaigne, the liquid having been previously nearly neutralized by carbonate of soda. The advantages which Dr. Letheby assigns to this two-fold process are its delicacy, the avoidance of froth, and (in the case of Lassaigne's process) the absence of the fallacies occasioned by antimony. The objection to the process is the number of stages of which it consists, but it is doubtless to be preferred to the plan suggested by the Prussian scientific committee.

4. *Arsenical Candles.* On Friday, January 3, 1845, an inquest was held by one of the deputy coroners for Middlesex, on the body of Joseph Haggett, aged 21, late a workman in the employ of Messrs. Le Paige and Co., composition candle manufacturers, Great Suffolk street, Borough. The case is important, as it proves the continued use of arsenic in the manufacture of candles, in spite of the exposure which was made of the practice some years since; as also that the process of manufacture, as well as the use of the candles themselves, may be attended with danger. It appears from the evidence that the deceased first complained of his hand being poisoned on Wednesday the 25th December, and that he died on the Monday following. Mr. Edward Roe, surgeon, saw the deceased on Saturday morning, when he found him with the left hand and fore-arm, and the glands of the axilla swollen, and an abrasion at the back of the hand. The angry appearance of the limb satisfied him that it had been poisoned. Saline draughts, fomentations, and poultices were ordered, but the patient got worse, purple patches appeared on the arm and side, and he died, as has been stated, on Monday morning. From the evidence of the employer, Mr. Le Paige, it appeared that, instead of using 8 ounces of arsenic to 1 cwt. of the stuff, as in other manufactories, he employed only 2 ounces, and that this was the only case which had come to his knowledge in which injurious consequences had resulted from its use. The same witness stated that in France and Belgium they were not allowed to use arsenic in the composition of candles. Might not the prohibition be extended to England?*

5. *Treatment of cases of Narcotic Poisoning.* In a paper on asphyxia by Mr. Erichsen, it is stated,† "that undoubtedly one of the most effective plans of treatment, in cases of narcotic poisoning, when complete insensibility has supervened, is, after the stomach has been emptied of its contents, to stimulate by every means in our power the *medulla oblongata* to increased activity, so as to enable the respiratory movements to be kept up in such a way that the blood may be duly aerated; for this purpose we are in possession of no agent at all comparable to slight electric or electro-magnetic shocks passed through the brain and upper part of the spinal cord. Since I published—three years ago—two instances of its successful application, several cases have been reported in the journals; and I have had within the last twelvemonth another opportunity of testing its efficacy in an almost hopeless case, in which an infant had been poisoned by an overdose of Dover's powder, and in which the ordinary means, such as the cold affusion, ammonia, &c. had failed in arresting the progress of the narcotism."

6. *Poisoning by Tartaric Acid.* A man, named William Watts, aged 24, a cab-driver, who resided in Rawstorne-street, purchased what he supposed to be an ounce of "tasteless salts," at the shop of a chemist named Watkins, on Saturday, the 7th of December last. At between five and six o'clock in the evening, having dissolved the white powder which he had obtained in a mug containing half a pint of warm water, he drank off the solution, and instantly exclaimed to his wife that "he was poisoned; that he had a burning sensation in his throat and stomach as though he had drunk oil of vitriol; that he could compare it to nothing but being 'all on fire.'" A practitioner was immediately sent for; a preparation of soda and magnesia was at once administered, and diluent drinks were freely given. Sickness set in, he went to bed directly, vio-

* Historical Register, Jan. 5, 1845. † Edin. Med. and Sur. Jour. Jan. 1845.

lent inflammation of the stomach and intestines ensued, and he did not leave his room again until he was taken out a corpse, the vomiting having never ceased during life. The *post-mortem* examination showed that an intense inflammatory action had been set up throughout nearly the whole of the alimentary canal. The druggist admitted that he had sold tartaric acid in mistake for the tartrate of soda. An inquest was held on the body, and a verdict of manslaughter was returned against Peter Watkins. The bottles labelled "acid. tart." and "sod. tart." were standing on a shelf next to each other: to this circumstance the accused person attributed the mistake which he had committed. The examination of the body was made by Mr. William Seth Gill, surgeon, of Clerkenwell.*

7. *Poisoning by Ergot of Rye. Post-mortem appearances.* A child, 10 years of age, died after having both legs amputated in consequence of gangrene produced by this poison. On opening the body the following appearances presented themselves. The brain was healthy, but the veins of the membranes turgid with blood, and there was a tea-spoonful of rose-coloured serum in each lateral ventricle. The right lung presented the third degree of pneumonia in its lower two thirds, and the second degree in the remainder. Near its surface there was a single abscess capable of holding a hen's egg. The left lung presented the first degree of pneumonia. The liver was quite healthy. The veins proceeding from the stumps were quite healthy. A second child, 28 months old, in whom spontaneous amputation of the right leg had taken place, was doing well.†

§ II.—*Infanticide.*

8. *Case of alleged Infanticide, in which it is supposed that suffocation was induced by a quantity of mud having been impacted into the œsophagus, with Remarks. By* J. A. Easton, M.D., *Professor of Materia Medica in Anderson's University, Surgeon to the Glasgow Police, &c. Read before the Medico-Chirurgical Society of Glasgow on the 13th of August,* 1844.

The facts of this case, as detailed by the medical and other witnesses, are as follows:—A workman discovered in an old quarry what appeared to him to be the foot of some animal sticking up from a quantity of soft mud. The foot, on closer inspection, was found to be that of an infant, of which the head and features could be seen under the surface of the mud. On inspection of the body, it was found to belong to a male child, apparently about three weeks old, stout, well formed, and obviously not the victim of a protracted illness. The internal appearances were unusual congestion of the liver and lungs, the latter of which viscera were of the deep-violet colour, which is seen in the lungs of those who have died from suffocation. The other organs were natural and healthy. The stomach contained somewhat more than an ounce, by weight, of nearly *solid mud*, and the gullet, throughout the greater part of its length, was blocked up by a similar substance, and a small quantity was likewise found on the tongue and in the mouth. The anterior nostrils contained a little mud, but they were perfectly pervious, while the back part of these tubes, and the larynx and windpipe were free of any obstruction whatever. This statement of the post-mortem appearances is

* Lancet, Jan. 4, 1845. † Gazette Médicale, 18 Janv. 1845.

on the authority of the reporter of the case, and Dr. Robert Macgregor. The following is the attested opinion of the same gentlemen as to the cause of death. "After having minutely examined the quarry in which the corpse was found, the position in which it lay, the consistence and the quantity of the mud, we are clearly of opinion that the death of this child must have been caused by the stuffing of the gullet with mud, which must have pressed on the windpipe so forcibly as to cause suffocation" Dr. Easton supports the opinion of the reporter by conclusive arguments. He argues, in the first place, that the mud could not have found its way into the œsophagus and stomach after death; for, except in advanced stages of putrefaction, not even water can find its way into the stomach, unless the body be sunk to a considerable depth. In this instance the process of putrefaction had not set in, and the body was found barely covered by mud. Again, if the mud found its way into the œsophagus and stomach after death, why did it not also enter the larynx and trachea, which are necessarily kept open by the elasticity of their cartilages, while the sides of the œsophagus are kept in juxtaposition. Lastly, Dr. Easton contends "that had the mud found its way into the œsophagus and stomach by gravitation, the stomach and lower part of the œsophagus ought to have been found distended, and the upper part, if any part, empty; whereas the stomach contained but a comparatively small quantity of mud, while the œsophagus, in the greater part of its extent, but particularly in its upper half, was stuffed with it. It is much more easy, as Dr. Easton observes, to account for the mud in the œsophagus and stomach on the supposition that it was introduced during life. "The mud being forced into the mouth during life, a portion of it was swallowed during the convulsive struggles of death, and thus was the stomach filled in part, but simultaneously with the extinction of life departed the power of deglutition, and thus the œsophagus,—arrested in the very act of performing its function,—became impacted, while between it and the stomach there remained a distinct hiatus, which unaided gravitation was unable to fill." The spasmodic contraction of the glottis, at the same time prevented the entrance of the mud into the air-passages. Suspicion fell upon a female whose child, about the same age as that of the one found in the mud, had disappeared, and she was arrested, but from the impossibility of identifying the child, or the clothes found upon it, the woman was set at liberty.

Two cases of infanticide, illustrating the inoperative state of the law, have occurred during the half year. In the one the infant was found with a tape tied round the neck; in the other, the head was nearly severed from the body. Both the guilty parties escaped, because it was impossible to prove that the children had been *born alive*.

9. *The Lung Tests. Test of pressure.* The value of this test as a means of distinguishing respiration and inflation has been discussed by Dr. Guy in two communications to the *Medical Times*, of which the first bears date Nov. 30, 1844, and the second Feb. 8, 1845. As the latter is but an addition to the former, both may be noticed in this place. In his first communication Dr. Guy gives a case, on the authority of Dr. Henry Browne, physician's assistant to the King's College Hospital, in which inflation was practised with the effect of freely distending the lungs of a still-born child, and yet on submitting several of the smaller buoyant portions of the lung to pressure, by twisting them between the folds of a towel and kneading them, "they could not be made to sink till reduced

to mere shreds." In his second communication two cases are given on the authority of Mr. Hensley, in both of which inflation was practised on still-born infants, with the effect of distending the lungs, though less completely than in Dr. Browne's case. In the first case it is stated that each portion of the lungs floated in water, "nor could any portion be made to sink by repeated pressure, by twisting in a coarse cloth, and even treading thereon." In the second case, the inflated portions of the lung "could not be made to sink by pressure in a cloth, so long continued as to reduce them to mere shreds." An additional case, observed by Dr. Browne, "in which inflation was successfully practised, and pressure unsuccessfully used as a means of discrimination," is alluded to by Dr. Guy, who concludes his examination of the test of pressure by extending his condemnation of it to every possible degree of distension of the lungs. "I have, therefore," he states, "no longer any hesitation in rejecting the test of pressure to whatever extent the lungs may have been distended." If this opinion of Dr. Guy is well founded, the hydrostatic test must be admitted to be no longer of any use; for the floating or sinking of the lungs can teach us nothing more than an inspection of the lungs themselves.

§ III.—*Insanity.*

10. *The Question of Criminal Responsibilty* was mooted in the case of James Gibson, a weaver, tried for *fire-raising*, in the High Court of Justiciary at Edinburgh, on Monday the 23d December last, before the Lord Justice-Clerk (Hope), and Lords Moncrief and Cockburn. It would be impossible, under several pages, to give a satisfactory analysis of this case; we must therefore refer the reader to the *London and Edinburgh Monthly Journal of Medical Science*, Feb. 1845, where the case is given at length from the notes of the criminal law reporter, the judge's charge being corrected by himself. The case was one of those difficult ones which we may expect to be of frequent occurrence, where the words and actions of a sane man were, both before and after the trial, so mixed up with symptoms of unsoundness as to lead some parties, and among the number one medical witness, to believe that the man was feigning. The evidence of several witnesses who had known Gibson previous to the fire-raising, was to the effect that they thought him of weak mind, and he was very generally known as "daft" Gibson. It was also distinctly proved that he had been subject to delusions. The evidence of the medical men confirmed the statements of the other witnesses, and eight out of nine medical men, of whom the greater part were either practically versed in diseases of the mind, or prepared by the nature of their studies, and their general talents and acquirements, to form a trustworthy opinion, were in favour of the prisoner's insanity. The judge's charge, in face of this decided balance of opinion, was strongly against the prisoner's insanity, and the evidence of the medical witnesses was undervalued to an extent unusual even in a court of law; while the jury were flattered by being told that they were in a better position to judge of the real state of the prisoner's mind than the medical witnesses, who had repeatedly and most carefully examined him. The jury unanimously found the panel "guilty as libelled," and consequently disallowed the plea of insanity. The case is one deserving of a more minute examination than our space will allow us to devote to it. The

judge's charge especially invites comment, and no part of it more than the statement that the question whether the delusions were real or feigned, was "purely a jury question." One of the most difficult and delicate questions in the world purely a question for a jury! If medical evidence be really so worthless, it may not be amiss to state that in this case, three or four non-medical witnesses, who saw the prisoner after the crime, were distinctly of opinion that he was not feigning. It must be a subject of regret to medical men that, after being summoned to the witness-box, as if they were prepared to render some service to the cause of justice, their opinions should be so strangely undervalued. It would certainly be more consistent to let the jury, whose penetration seems to be so superior, examine the accused for themselves, or to appoint examiners from the class of men to whom they belong. In this way the profession would at least be saved unnecessary trouble and obloquy. The writer of this has been since informed that James Gibson, prior to the carrying of the sentence of transportation into effect, was lodged at the Millbank Penitentiary, where he had not been more than a day when the physician of that establishment, with the concurrence of an eminent surgeon, sent him off to Bethlem Hospital as being decidedly insane. This he did in entire ignorance of the particulars of his case, or the fact that the plea of insanity had been raised in regard to him. Gibson is detained at Bethlem as a proper subject of treatment.

§ IV.—*Wounds and Injuries.*

11. *Rupture of the Spleen.* J. W., a robust man, about 40 years old, was engaged in a scuffle with B. R, a man of the same size, and received one blow from the fist of his opponent in the left hypochondric region; the combatants then closed with each other, and so equal were their exertions for five or ten minutes that it seemed doubtful which would come off victor; at length, however, the strength of J. W. seemed suddenly to fail. He turned pale, staggered, and sank helpless upon the ground, complaining of nausea, faintness, and pain in the left side. He was carried in a sinking condition a short distance to a house, where he expired, in about 15 minutes after the termination of the conflict. On inspecting the body, no marks of violence were observed on the exterior, but on opening the abdomen the spleen was found enlarged to about five times its natural dimensions, and so soft in texture as to be easily broken down under slight pressure from a finger. Upon its posterior surface was a lacerated fissure of about five inches in length, extending deep into the centre of the organ. Between two and three quarts of dark, partially coagulated blood were found in the cavity, and there were about two ounces of effused serum in the pericardium. The coroner's verdict was as follows: "Death from lacerated diseased spleen, caused by a blow, fall, or over-exertion, while engaged in a scuffle with B. R." B. R. was tried for manslaughter, and acquitted by the circuit court.

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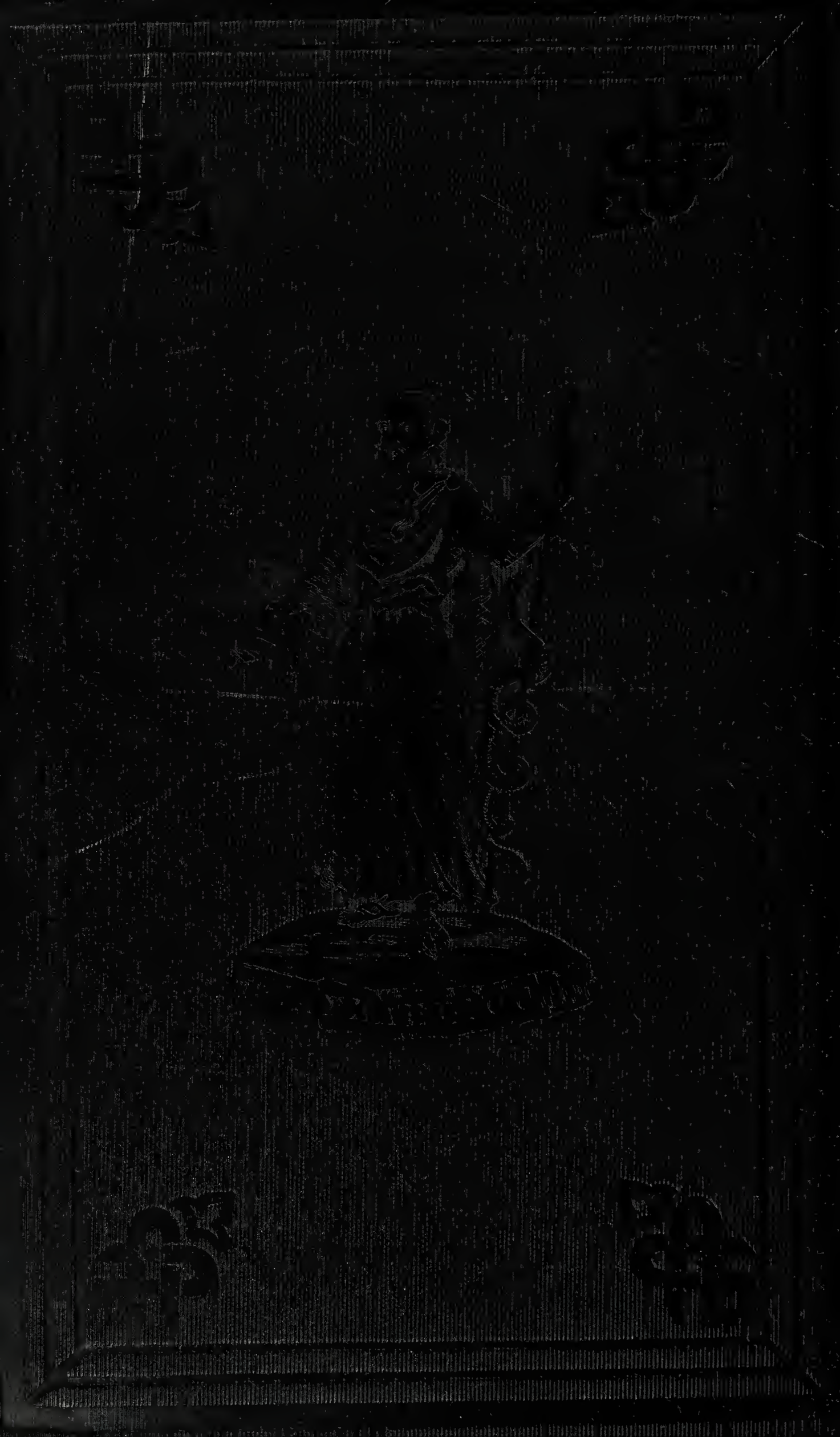
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